REPORT

OF THE

MINISTER OF AGRICULTURE

FOR THE

DOMINION OF CANADA

FOR THE

YEAR ENDED OCTOBER 31

1900

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To His Excellency the Right Honourable Sir GILBERT JOHN ELLIOT, *Earl of Minto and Viscount Melgund of Melgund, County of Forfar, in the Peerage of the United Kingdom, Baron Minto of Minto, County of Roxburgh, in the Peerage of Great Britain, Baronet of Nova Scotia, Governor General of Canada.*

MAY IT PLEASE YOUR EXCELLENCY—

I have the honour to submit to Your Excellency the annual report of the Department of Agriculture, for the year ended October 31, 1900.

I.—GENERAL REMARKS.

A synopsis of the work of the department and of the operations of the various branches comprised therein is laid before Your Excellency. The work in each has been efficiently carried out.

The legislation affecting the department during the last session consisted of Chapter 10, 63-64 Vic., intituled 'An Act to Authorize Contracts with Certain Steamship Companies for Cold Storage Accommodation.'

Chapter 25, 63-64 Vic., 'An Act to Amend the Copyright Act.'

Chapter 30, 63-64 Vic., 'An Act to Amend the Experimental Farm Station Act.'

Chapter 31, 63-64 Vic., 'An Act to Amend the San José Scale Act.'

Also, Chapter 33, 63-64 Vic., 'An Act Respecting the Incorporation of Live Stock Record Associations.'

By an order approved by Your Excellency in Council on March 13, 1900, in virtue of the provisions of section 2 of chapter 68 of the Revised Statutes of Canada, intituled 'An Act Respecting Quarantine,' the quarantine regulations, as made and amended by orders in council dated August 18, 1898, and April 4, 1899, respectively, were further amended.

By proclamation dated March 13, 1900, the amendment to the quarantine regulations made by the order in council above referred to, was published in the *Canada Gazette* (vol. xxxiii, p. 2005).

Also, by order in council under date of April 25, 1900, under the provisions of section 5 of 'The San José Scale Act,' the order in council dated March 18, 1898, was amended.—(*Canada Gazette*, vol. xxxiii, p. 2308.)

Strong representations having been made to me with regard to the need of protection for Canadian authors and publishers similar to that enjoyed by such persons in the United Kingdom, I took into careful consideration the whole question of Canadian copyright with the view of discovering, if possible, a means to remove the causes of the friction and clashing that had existed for some time between those in Great Britain and those in Canada who are interested in copyright.

My conclusions were that Canadian authors and publishers had reason to complain of their position under Canadian copyright, and that they might reasonably expect better protection from unjust competition. Notwithstanding previous doubts, it seemed to me that it was possible to remove the causes of friction by judicious legislation. With this object in view, last session I introduced a Bill, 'An Act to amend the Copyright Act,' which duly became law, and I am happy in the belief that this enactment, which has met with general approval, has been the means of placing all in any way interested in copyright in Canada upon a better footing and of securing for them equitable and adequate protection from unjust competition. And I may add that in this belief I am not alone, both parties agreeing that the action taken will be of great advantage, and will put matters upon a much better footing. That this feeling should prevail amongst those so closely connected with copyright and whose judgment therefore is valuable, is a further source of gratification.

UNIVERSAL EXPOSITION, PARIS.

Canada's display at this great exhibition has done much to give her a leading place amongst the nations of the world. The exhibits of natural products and manufactured articles attracted much attention, and have been very favourably commented upon by the press. Nothing better could have been devised to advertise the vast resources of the Dominion than the excellent display of economic minerals and other natural products, while the manufactured goods were very tangible illustrations of the great progress which has been made in industrial arts in this country during the past few years.

As a result of this exhibition I think we may confidently expect that more home and foreign capital will be diverted to Canada for investment in Canadian undertakings, and that there will be an increase in our foreign trade in manufactured goods and natural products.

To indicate the general excellence of the Canadian exhibits it is only necessary to give the number of awards which were gained, viz.:

Grand prix, diplomas	30
Gold medal diplomas	76
Silver medal diplomas	95
Bronze medal diplomas	70
Honourable mention diplomas	35

The Hon. J. Israel Tarte, M.P., Minister of Public Works, was appointed Chief Commissioner for Canada at the Universal Exposition at Paris, and spent several months there in the interests of the Dominion.

The following also assisted in the representation of Canada as Honorary Commissioners:—

Madame Raoul Dandurand, Honorary Lady Commissioner.

Hon. F. G. M. Dechene, Honorary Commissioner.

Hon. F. E. A. Evanturel, Honorary Commissioner.

Rev. Father C. P. Choquet, Honorary Commissioner.

Hon. Thomas Ballantyne, Honorary Commissioner.

During the summer of 1901 an International Exhibition will be held at Glasgow, Scotland, in which Canada has been invited to participate.

Realizing that a Canadian exhibit there, similar to the one we had at Paris, would be the means of bringing the excellence of our products more directly before the British public and result in an increased trade with the motherland, the Canadian Government has accepted the invitation, and parliament has voted a sum of money to defray the expenses of an exhibit.

A large number of the exhibits used at Paris will be forwarded direct to Glasgow. Those which have deteriorated in any way will, of course, be replaced by fresh ones, and the exhibits of fruits, dairy produce, &c., will be entirely new.

A notice of this exhibition has been published in the *Canada Gazette* for the information of those who may desire to have exhibits at the Exhibition.

II.—ARTS AND AGRICULTURE.

COMMISSIONER'S BRANCH.

GENERAL SCOPE OF THE WORK.

About forty-five per cent of the population of Canada are in families whose heads and members are engaged in farming. A large number more are employed in industries arising out of agriculture. Among these are millers of flour and oatmeal, curers and packers of meats, makers of cheese and butter, and persons occupied in the transportation and commerce of grain, hay, live stock, meats, butter, cheese, milk, eggs, fruit and various other products.

The difficulties in the way of successful farming become greater and more numerous every year. Some of them arise from the partially exhausted condition of the soil in localities; and from the need for maintaining or increasing the fertility in all places. The simple cultivation which prepared a suitable seed-bed out of virgin soil is no longer sufficient. Weeds also—the thieves of plant food—are becoming more and more an ever present trouble. The greatest difficulties are mainly of four sorts: (1) Those which beset the farmers in the growing and saving of crops; (2) those which arise from the demands of markets for superior qualities of all products, (3) those which come from the change from the cultivation of cereals and hay to diversified or mixed farming consequent on the growth of population in cities and towns,

and the new opportunities provided for exporting fine perishable products through cold storage and other improved transportation facilities ; and (4) those which result from the low prices for the most of the staple farm products through the world-wide keen competition.

The department continues its efforts to help the farmers by those means which have been used successfully in past years. One of the main objects is to furnish information which will be directly helpful to those engaged in farming, and which will at the same time have an educational value through developing intelligence and practical ability, and promoting such co-operation as will lead to the further advancement of their interests.

THE OPERATIONS OF FARMING.

It is essential in all profitable agriculture to obtain large crops of good quality at as little expense as possible. After a farmer has settled upon the areas of crops which he will put in, there remains the matter of selecting the particular variety of each sort of seed he will sow or plant. The department is trying to impress upon the minds of the farmers the benefits which may be expected from carefully selecting the best quality of seed from varieties which are adapted to their localities.

Improvements are being made in field cultivation, particularly in a more general following out of some systematic rotation of crops, in the growing of clover, and in the greater attention being given to the selection of seed grain.

In this connection it is with pleasure I mention the fact that Sir William C. Macdonald generously placed the sum of ten thousand dollars in the hands of Professor Robertson to be offered in prizes to encourage boys and girls on Canadian farms 'to learn by doing,' to select seed-grain in such a manner as to grade up its productiveness, and to keenly follow up the practices as well as the principles of progressive agriculture.

The feeding of the crops or part of them to live stock is also essential to successful farming in Canada; and the better the crops of cereals, fodder and roots, the better is the chance to make the live stock of the farm pay. The feeding of live stock also makes provision for using up some inferior grains and other things not saleable, and turning them into superior qualities of animal products. To do that profitably gives room for the exercise of skill, wide exact knowledge and true economy.

A large portion of the bulky products of the farms is consumed by live stock. A marked improvement is evident in the stabling of horses, cattle and swine. Numerous buildings are constructed every year, well lighted, comfortable and convenient. Sufficient attention has not yet been paid generally to the ventilation of stables.

On the whole the live stock is fed with greater economy as the relative values of feeding stuffs become better known among farmers. In that respect the practices of the best farmers are readily copied by others.

Progressive improvement of live stock has been hindered more or less from want of continued attention year after year to the formation of a definite type of body suited to the main purpose of each breed of every sort of live stock. The climate of Canada and its suitability for growing large crops of wholesome nutritious forage plants, make

it possible for this to be a breeding ground for the best types of live stock. To succeed it is evident that educational work must be pushed wisely and energetically. If that be done there does not appear any reason why the breeding of horses, the breeding of beefing types of cattle, the breeding of sheep, and the breeding of poultry for fattening, should not make proportionately as much advance per year as has been made in the development of dairying and of the cheese, butter and bacon trades.

Another essential to a continuation of good farming is ability to keep up the fertility of the land without purchasing fertilizers to such an extent as to absorb all or most of the profits. The growing of clovers, pease, beans and other leguminous crops, the feeding of them to live stock, and a careful saving of everything on the place that has manurial value, are in the right direction. The department tries to direct attention to these fundamental principles which are still apt to be overlooked in farm practice.

THE PRODUCTS FROM FARMS.

Whether a farmer sells what may be called primitive raw products, such as grain, hay, roots, or other crops, or feeds these to live stock, and markets them in other forms, reduced in volume but increased in value, as in butter, cheese, cattle, swine, poultry, eggs, horses, sheep or wool, he needs reliable information on the qualities of those for which there is likely to be a good demand and a fair price. Sometimes that information is thrust upon him harshly enough, by close market contact—by getting only a ruinously low price for what he has to sell, if it proves unsuitable for the market he supplies. As far as the department through its various agencies can help the farmers in that matter, it is endeavouring to do so.

Much information of practical value has been obtained from time to time from those engaged in the commerce of agricultural products, and from those who manufacture what may be called the raw products of the farm. Curers of bacon, exporters of cheese and butter, shippers of live stock, flour millers and others, have greatly assisted the department by specific information on the qualities of products which are in demand for the home and export trades. Farmers are becoming more and more alive to the benefits that result from co-operating with such men in those matters.

Fine food products, such as meat, butter, poultry, eggs, and to some extent fruit and cheese, are of a readily perishable character, and cannot be delivered in distant markets in their best condition without special accommodation for carrying them safely. Any absence of freshness and daintiness of flavour and appearance lessen their value very greatly. It is evident that the production of such foods, even when carried on in the most skilful and economical manner, cannot be permanently profitable unless means are used for their preservation, so that the consumer can obtain them in an undeteriorated state.

Bulletins and reports for imparting information have some value, particularly to the investigating farmers. The department has availed itself of these means. The agricultural press and the newspapers of Canada have given valuable assistance in publishing what has been supplied to them, in a most liberal and effective way.

Much of the time and energy of the commissioner's branch have been taken up in correspondence and the giving of personal advice and information to farmers, and others connected in some capacity with the art or business and commerce of agriculture.

In so far as the work of the department directly for farmers can take the character of object lessons to illustrate principles, practices and methods, it will the more speedily tell for good on their occupation.

The chief other matters to which attention was given in this branch in 1900 were : the work of the Live Stock Commissioner, the cold storage service, the extension of markets, trial shipments of tender fruits, an examination into the condition of cheese, butter and apples being exported, with special reference to the packages and handling of the same in loading and unloading ocean steamships, the carrying on of illustration stations for the fattenting of chickens, and the exportation of the same to Great Britain, the curing of cheese at a controlled cool temperature, and general dairying service.

LIVE STOCK COMMISSIONER'S DIVISION.

During the past year, the Live Stock Commissioner has made a careful examination of the live stock conditions in each of the provinces and territories. Where needed, assistance has been given in the establishment of live stock associations, with the view to inducing the farmers to unite in self-help, and also that the department may be brought in touch with the best men in each district, and thus obtain their united co-operation in forwarding the live stock interests of Canada.

Much information of a practical and useful nature has been distributed during the year in the form of circular letters addressed directly to farmers and stock growers, to secretaries of local live stock associations, farmers' institutes, fair boards and kindred bodies. Upwards of 25,000 of these circular letters have been sent out during the year. Much information has also been sent to the people in the form of newspaper articles which have been forwarded to the leading agricultural and weekly papers published in the various sections of Canada.

The rules and regulations governing the Live Stock Record Associations have been carefully investigated and an effort has been made to consolidate a number of these associations to the end that there be but one record for each recognized breed in Canada, and that this record be conducted in the best possible way. Heretofore these associations, though Dominion in scope, have not been incorporated by the Dominion government.

A large number of public meetings have been addressed by the commissioner and by members of his staff. These gatherings have been well attended, and considerable interest has been aroused.

The establishment of annual auction sales of live stock for breeding purposes has been brought to the notice of the people. British Columbia has taken the matter up, and has recently held a successful sale ; and in Ontario two provincial sales are announced.

COLD STORAGE DIVISION.

Cold storage is intended to preserve commodities and thus avoid direct loss ; it is useful to extend the period during which they can be marketed ; and it thus gives the owners a wider chance to choose their own time for selling. The best service is to be obtained from cold storage by its use for the preservation of commodities on their way to the consumers. The less time they are on the way, as a rule, the better will be the ultimate results.

In the planning and carrying out of a system of cold storage for Canada, various interests have to be taken account of, viz.: the producers, the collecting buyers, the carriers or transportation companies, the distributing merchants, and the consumers, In so far as a cold storage system helps to prevent losses and deterioration of quality, it gives every handler a chance for more profit and leaves more wealth in the country. The arrangements have been made mainly for cold storage for food products intended for export. Advantages have been provided incidentally for products for home consumption.

With what is practically a chain of cold storage available, the superior quality of Canadian products will be further recognized by importing merchants and consumers in the countries to which they go.

COLD STORAGE ON STEAMSHIPS.

Contracts were entered into with agents of steamship companies to provide a regular cold storage service for the carriage of butter and other perishable products from Montreal to points in Great Britain, in chambers cooled and kept cool by mechanical refrigerating machinery of the best and most modern sort.

Messrs. Elder, Dempster & Co. agreed to provide cold storage on five steamships to give a weekly service between Montreal and Avonmouth for Bristol.

Messrs. H. & A. Allan agreed to provide cold storage on two steamships to ply between Montreal and Liverpool ; three steamships to ply between Montreal and London ; and on one steamship to ply between Montreal and Glasgow.

Messrs. R. Reford & Co., for the Thomson Line, agreed to provide cold storage on three steamships to ply between Montreal and London ; and, on behalf of the Donaldson Line, on one steamship to ply between Montreal and Glasgow.

Messrs. David Torrance & Co., for the Dominion Line, agreed to provide cold storage on two steamships to ply between Montreal and Liverpool.

Sailings of the steamships of the Allan and Dominion lines between Montreal and Liverpool were to be so arranged as to give as nearly as practicable a weekly service between these two ports ; and the sailings of the steamships of the Allan and Thomson lines were to be so arranged as to give as nearly as practicable a weekly service between Montreal and London ; and the sailings of the steamships of the Allan and Donaldson lines were to be so arranged as to give as nearly as practicable a fortnightly service between Montreal and Glasgow.

These contracts, which were for three years, expired at the end of navigation from Montreal in 1899.

Messrs. Furness, Withy & Co., Limited, agreed to provide cold storage on two steamships to ply between St. John, N.B., Halifax, N.S., and London.

The Manchester Liners, Limited, agreed to provide cold storage on three steamships to ply between Montreal and Manchester during the season of navigation on the St. Lawrence River, and to ply between St. John, N.B., Halifax, N.S., and Manchester during the remainder of the year. These contracts were for the seasons of 1898, 1899 and 1900.

These contracts provided that the steamship companies shall carry in cold storage butter, cheese and other perishable products, as demand for space may arise, at a charge not exceeding ten shillings per ton of 2,240 pounds of butter and cheese, and at the same charge for an equivalent space occupied by other products, in addition to the current charge for freight on butter and cheese not in cold storage.

Messrs. Pickford & Black agreed to provide cold storage on the steamship *Beta*, to ply between Halifax, N.S., and the West Indies.

New contracts were entered into with the agents of lines to Liverpool, Glasgow and London for increased cold storage accommodation to these ports. Messrs. H. & A. Allan agreed to provide cold storage on three more steamships to ply between Montreal and Liverpool ; they also agreed to provide cold storage on two steamships to ply between Montreal and Glasgow, and to leave two steamers for Liverpool and one steamer for Glasgow, which were fitted for cold storage under the contracts which expired in 1899, on these routes without any further subsidy, for the seasons of 1900 and 1901.

Messrs. R. Reford & Co., for the Thomson Line, agreed to provide cold storage on three more steamships to ply between Montreal and London ; and to leave three other steamers which were fitted with cold storage under the contracts which expired in 1899, on the route without further subsidy for the seasons of 1900 and 1901. Messrs. R. Reford & Co., for the Donaldson Line, agreed to provide cold storage on two more steamships to ply between Montreal and Glasgow ; and to leave one other steamer, which was fitted with cold storage under the contract which expired in 1899, on that route without further subsidy for the seasons of 1900 and 1901.

These contracts provide that the steamship companies shall carry in cold storage butter, cheese and other perishable products, as demand for space may arise, at a charge not exceeding fifteen shillings per ton of 2,240 pounds of butter and cheese, and at the same charge for an equal space occupied by other products, in addition to the current charge for freight on butter and cheese not in cold storage.

The whole of the cold storage space on all the steamships from the beginning of the service, has been reserved to Canadian shippers until within four days of the sailing of the steamships.

The following is a statement of the quantities of some Canadian products carried in cold storage from the port of Montreal during the seasons of navigation of 1898, 1899 and 1900 respectively :—

		1898.	1899.	1900.
Butter	packages	209,172	429,734	227,863
Cheese	"	5,514	1,406	.....
Fruits	"	25,564	16,381	8,785

A self-registering thermometer, called a thermograph, and capable of making a continuous record of the temperature for fourteen days was put into nearly every cold storage chamber every voyage. The charts made by these instruments were sent back to the department after the cargo was discharged. They furnish useful information to the shippers, to the ship's engineers and the department.

COLD STORAGE ON RAILWAYS.

Arrangements were continued for the running to Montreal of refrigerator cars fully iced from fifteen starting points on the Canadian Pacific Railway, from sixteen starting points on the Grand Trunk Railway, from two starting points on the Quebec Central Railway, from two starting points on the Intercolonial Railway, from five starting points on the Canada Atlantic Railway, from one starting point on the Quebec and Lake St. John Railway, and from two starting points on the United Counties Railway. Six of these ran once a fortnight, the other thirty-seven ran weekly.

The railway companies provided the refrigerator cars, and every car was iced to receive butter and other products requiring cold storage, at stations between the starting point and destination. Shippers who made use of these refrigerator cars were charged the regular 'less than carload rates,' and no extra charge was made to them for the cold storage services.

COLD STORAGE WAREHOUSES.

Cold storage warehouses of sufficient capacity for the trade are provided in Montreal as private business concerns. For the protection of perishable products intended for export and for the extension of business, it is desirable to have cold storage buildings at other centres. As the volume of trade at first would not likely be sufficient to induce business men to put up such buildings for the accommodation of products intended for export, a grant was offered to those who would provide cold storage buildings at central points. The grants were to be in the nature of guarantees that the earnings from the cold storage business at these points would yield at least 5 per cent on the cost of the buildings and plant.

The rates to be charged were to be satisfactory to the Department of Agriculture, and the grants from the government were not to be called upon, except to make up any deficiency between the net earnings and the sum of 5 per cent on the cost as mentioned. Advantage was taken of this offer at Quebec only.

An agreement was made with Messrs. B. and M. Rattenbury, the owners of a cold storage building at Charlottetown, P.E.I., to provide cold storage there for the use of the public at reasonable rates.

COLD STORAGE AT CREAMERIES.

To encourage the owners of creameries to provide cold storage accommodation at them to protect the butter in cold storage from the day after it is made, I caused it to be announced that the government would, subject to ratification by parliament, grant a bonus of fifty dollars ($50) per creamery for every creamery at which the owner would provide and keep in use a refrigerator room according to the plans and regulations, during the season of 1897 ; and further bonuses of twenty-five dollars ($25) per cream-

ery for 1898, and of twenty-five dollars ($25) per creamery for 1899, if and when the refrigerator room was provided and kept in use according to the plans and regulations during these years.

Plans showing the style of construction to be adopted for the insulation of old cold storage rooms and the methods of constructing new cold storage buildings and ice houses were furnished on application.

When the bonus was made available for those years, a great many of the owners of creameries did not appear to understand the benefits which would result to themselves from providing cold storage; and some did not learn of the offer of the government bonus in 1897 in time to construct the cold storage for use during that summer. To encourage the owners of creameries to provide the cold storage which is so necessary, I intimated that the government would extend the provisions of the bonus offered in the circular published October 26, 1896.

To the owners or lessees of creameries who did not obtain the bonus of fifty dollars ($50) for 1897, 1898 or 1899, the government will grant a bonus of fifty dollars ($50) per creamery if and when its owner provides and keeps in use a refrigerator room according to the plans and regulations during the season of 1900, and the further bonuses of twenty-five dollars ($25) each for the seasons of 1901 and 1902, if and when the refrigerator room has been kept in use according to the regulations during these two seasons.

Thus the owner of a creamery who provides the necessary refrigerator room and keeps it in use according to the regulations during the three years ending 1900 or 1901 or 1902, as the case may be, may receive altogether a bonus of one hundred dollars per creamery.

The owners of over 400 creameries have provided cold storage in accordance with the regulations.

COLD STORAGE INSPECTORS.

Inspectors of cold storage visited creameries which had provided cold storage rooms through Ontario and Quebec. They also visited places where cold storage buildings were being put up for the protection of general food products of a perishable character. Another cold storage inspector, with headquarters in Montreal, inspected the refrigerator cars on their arrival, examined the cold storage chambers on steamships, and looked after any through shipments of butter or other perishable products intended for cold storage, when notified by the shippers to do so.

EXTENSION OF MARKETS DIVISION.

By my direction the Commissioner of Agriculture and Dairying visited some points in Great Britain during the summer. He continued inquiries on the existing conditions of the markets for perishable farm products there, sought to learn the preferences for styles of packages and quality of goods, and gave information to merchants concerning the arrangements made by the government for providing a cold storage service for the carriage of these products.

Four agents of the department have been sent to work in Great Britain for the extension and improvement of trade in Canadian farm products. They have been instructed to observe and examine carefully the manner in which the products are handled in the unloading of the steamships for the purpose of enabling the department to take such steps as may be necessary to prevent the damage to cheese and fruit, which has been complained of by shippers and receivers from want of effective cool ventilation on steamships. The want of care in unloading, in handling on the docks, and in carting to the railways and to warehouses, has in the past broken and injured a large percentage of the packages. The representations of these agents of the department have already contributed to the means which have brought about a noticeable improvement during the season.

By my direction the Commissioner of Agriculture and Dairying took supervision of the food products branch of the Canadian exhibition at the Universal Exposition at Paris. He also visited Paris in connection with the installation of cold storage chambers in the colonial building there. These were used successfully during the summer season. Butter, cheese, eggs and other readily perishable products from Canada were exhibited in cold storage there in perfect condition. Apples of many varieties—some of them of early ripening sorts, such as Fameuse and Gravenstein—were shown in quantities in Paris in perfect condition in June, July and August of this year. They had been kept in cold storage in Montreal until May, when they were sent in one of the many cold storage chambers, arranged for by the department, on steamships, during the past three years. Pears, peaches and grapes were also exhibited in fine condition in their season. This success is an evidence of the effective character of the cold storage facilities provided for the preservation and transportation of fruit when care is exercised in the selection and packing of it.

The Commissioner again reports to me that the superior qualities of Canadian flour for bread-making are not generally known by bakers or those who are directly interested. For sweetness, whiteness and strength, Canadian flour is unsurpassed. Bakeries for the sale of bread made from Canadian flour would doubtless be a profitable commercial venture for some business men in Great Britain, and would be of direct benefit to Canadian producers.

Independent analyses of various flours showed the quantity of albuminoids (flesh-forming principles in food) to be one-tenth greater in Canadian flour than in the flour imported into Great Britain from European countries.

The export trade in Canadian oatmeal is growing, and the fine qualities which it has from the soil and climatic conditions of Canada, are causing it to be preferred wherever it is introduced.

Inquiries and examination of Canadian cheese in several of the large commercial centres revealed the fact that most of it until September had been landed in Great Britain in a better condition than in some of the previous years. However, a large proportion of the boxes had been broken in transit. That tells against it in the markets. An investigation was begun at two cheese factories in Canada in 1899, as to the effect on the quality of the cheese of curing them during the summer months in a controlled cool temperature continuously under 65 degrees Fahr. That was continued at one factory during 1900. It is evident that through the improvement in

curing rooms at cheese factories, and by improved cool chambers in the steamships, it will be possible to deliver Canadian cheese in Great Britain with the flavour and quality as fine as those of the best English and Scotch.

There was a great development in the Canadian butter trade until the spring of the current year. The exports increased in value from $697,476 for the year ending June 30, 1895, after which the cold storage service was provided, to $5,122,156 for the year ending June 30, 1900. The decrease in the quantity manufactured and exported since that date has been due to the relatively high price of cheese. Many factories at which butter was made in 1899 were devoted to cheese-making during the summer of 1900.

There has been substantial increase also in the exports of bacon, hams and pork. Canadian brands are now among the best known in the United Kingdom and the quality is winning for them a steady growing demand. Some complaint was again made about the quality of some Canadian bacon. A little of it was complained of as being too fat, and a proportion of it as being somewhat soft. Soft sides often fetch from four to eight shillings per hundred weight less than firm sides of similar weight and otherwise apparently equal quality.

It was learned from dealers in eggs that Canadian eggs were gaining in favour. The Canadian package is preferred to all others, and the Canadian eggs in size, condition and flavour are generally giving satisfaction. When the eggs were carried in cold storage on the steamships, the surface was so cold that moisture from the humid and warm air of Great Britain, was deposited on the outside of each egg. That brought about a 'mussy' condition and prevented the egg from keeping well. Consequently the importers prefer to have the eggs delivered in a cold condition to the steamship, and then carried in cool, ventilated chambers across the ocean. That leaves them with bright, dry shells when the cases are opened.

The export commerce of the country in most of the farm products is increasing at a very rapid rate. The following comparative statement of the value of the exports of some of the farm products of Canada during the years 1896 to 1900, shows the growth in that short period and indicates somewhat of the great possibility for further expansion of this trade :—

VALUE OF SOME CANADIAN FARM PRODUCTS EXPORTED IN YEARS 1896, 1897, 1898, 1899 AND 1900.

(Years ending June 30.)

	1896.	1897.	1898.	1899.	1900.
	$	$	$	$	$
Wheat	5,771,521	5,544,197	17,313,916	7,784,487	11,995,488
Flour	718,433	1,540,851	5,425,760	3,105,288	2,791,885
Oats	273,861	1,655,130	3,041,578	3,268,388	2,143,179
Oatmeal	364,655	462,949	554,757	396,568	474,991
Pease	1,299,491	2,352,891	1,813,792	1,955,598	2,145,471
Cattle	7,082,342	7,159,388	8,723,292	8,522,835	9,080,776
Cheese	13,956,571	14,676,239	17,572,763	16,776,765	19,856,324
Butter	1,072,089	2,089,173	2,046,686	3,700,873	5,122,156
Pork, bacon and hams	4,446,884	5,871,988	8,092,930	10,473,211	12,803,034
Eggs	807,086	978,479	1,255,304	1,267,063	1,457,902

FATTENING OF CHICKENS.

Two years ago an investigation was made of the method followed for the artificial fattening of chickens in Great Britain. The demand for well fattened chickens is growing rapidly and extensively. In 1898 I authorized the establishment of two poultry-fattening stations, to test the process of poultry-fattening in Canada and to illustrate how it could be applied. Trial shipments of these fattened poultry were forwarded to Liverpool and London. The reports received state that the poultry arrived in fine condition, pleased the trade well in every way and were sold at good prices.

In 1899 I authorized the establishment of eight additional illustration stations for the fattening of chickens. Reports of those which were shipped to Great Britain indicate that there is an opening for the growth of a large trade. The chickens have been landed in good condition, have pleased the consignees, and have been sold at relatively good prices. Similar illustration stations have been carried on in 1900. The investigations and shipments confirm the expectation that this new branch of production may be extended with much profit.

TRIAL SHIPMENTS OF FRUIT.

Special provision was continued for making trial shipments of tender fruits, such as pears, tender apples and peaches in 1897, 1898 and 1899. A small cold storage building was provided at Grimsby, Ontario. The information which has been gained by the trial shipments for three years shows that pears and the early tender varieties of apples can be shipped in cold storage, landed in good condition and sold readily at satisfactory prices. It is important that the fruit should be picked in the right condition of ripeness for the particular variety. Only fruit of large size, good shapes and fine colour should be exported. Some of the shippers in the Niagara district desired to send further trial shipments on their own account and responsibility in 1900. A full report of these and of the former shipments will be published.

DAIRYING SERVICE DIVISION.

It gave me pleasure to be able to comply with requests from representative salesmen of butter and cheese factories, supported by the leading buyers and exporters of dairy products in Montreal, and to arrange for an official referee for butter and cheese at that port. His duties are to examine any butter or cheese about the quality of which there may be a difference of opinion or dispute between the seller and the buyer. He reports to both on the quality, and, where practicable, writes to the manufacturer suggesting what may be done to prevent or remedy such defects or faults as he may find in the lots examined. Mr. J. A. Ruddick, formerly one of the commissioner's staff of workers, who, in the meantime, had been in New Zealand as dairy commissioner of that colony, was re-engaged for Canada, and was assigned to the work at Montreal for 1900. His wide experience and thorough knowledge of the processes of making butter and cheese have enabled him to render further excellent service to these two important and growing industries.

CREAMERIES IN THE NORTH-WEST TERRITORIES.

The department has continued to manage the creameries in the North-west Territories. During 1900, butter was manufactured at 20 creameries; and 15 cream-separating or cream-collecting stations tributary to those were also under the charge of the department. A charge of 4 cents per pound for manufacturing was made. In cases where loans had been made to the manufacturing association, an additional charge of 1 cent per pound was made for a loan fund. The total quantity of butter manufactured from May 1 to October 31 was 636,998 pounds.

Two of the creameries in Alberta were continued in operation during the winter of 1898-9, and four of them were continued during the winter of 1899-1900, and three are to be continued during the winter of 1900-1901.

The butter-makers at most of the creameries in Alberta and Assiniboia report that there are good prospects for an increase in the output of butter from them next season.

GENERAL DAIRYING SERVICE IN THE PROVINCES.

The following paragraphs indicate the other principal work which was carried on during the year in the different provinces.

In the province of Quebec, the Assistant Dairy Commissioner held meetings during the year; and during the winter he delivered a series of lectures to each class of students at the dairy school of St. Hyacinthe.

In the province of Nova Scotia a dairy station was conducted at Nappan. Cheese has been made there during part of the summer, and butter during the winter.

The Dairy Superintendent of Nova Scotia has travelled throughout the province, visiting cheese factories and creameries and addressing meetings of farmers at various points.

He also assisted in carrying on the dairy school at Sussex, N.B., and addressed meetings in other places in New Brunswick.

The department has withdrawn entirely from the management of the dairy stations in Prince Edward Island. I am informed that the cheese factories and creameries on the island which had been under the management of this department, are now conducted by the directors of the several dairying companies with economy, efficiency and success.

It is reported that about 60,000 boxes of cheese were exported from the island for the season of 1900. The winter butter-making movement has been extended; and I am informed that at many factories in Prince Edward Island winter butter-making was carried on during the winter of 1899-1900. This shows a rapid development of co-operative dairying in that province from 1892, when there was but one factory taken charge of by the department.

The development of mining in British Columbia and in the Klondike region is opening new and profitable markets for butter and other dairy products from British Columbia and the North-west Territories.

In the province of Ontario, New Brunswick and Manitoba, superintendents of dairying are employed by the provincial governments, and consequently no work of direct instruction, except the attendance at conventions, and the distribution of bulletins and reports from this department was undertaken in them.

BRANDING AND REGISTRATION BILL.

Under the Act passed 'to provide for the Registration of Cheese Factories and Creameries, and the Branding of Dairy Products, and to prohibit misrepresentation as to the dates of Manufacture of such Products,' certificates of registration have been issued to 1,057 cheese factories and creameries, and applications are being received occasionally.

EXPORTS OF BUTTER AND CHEESE.

The magnitude and growth of the export trade of Canada in dairy products is shown by the following tables (years ended June 30) :—

Dominion of Canada—Exports of Dairy Products—Home Production.

BUTTER.

Year.	Quantity.	Value	To Great Britain.	To United States.	To France.	To Germany.	Other Foreign Countries.	B.N.A. Provinces.	British Indies.
	Lbs.	$	$	$	$	$	$	$	$
1869	10,649,733	1,698,042	534,707	1,015,702		1,496	14,870	95,777	26,989
1880	18,535,362	3,058,069	2,756,064	111,158			24,710	163,290	2,647
1881	17,649,491	3,573,034	3,333,419	58,522			30,574	143,935	6,584
1882	15,161,839	2,936,150	2,195,127	529,169			32,052	169,270	10,538
1883	8,106,447	1,705,817	1,330,585	206,154			29,446	131,341	8,291
1884	8,075,537	1,612,481	1,395,652	46,618			16,455	151,224	2,532
1885	7,330,788	1,430,905	1,212,768	16,695		15,172	21,473	161,862	2,835
1886	4,668,741	832,355	652,863	17,545			17,577	142,485	1,885
1887	5,485,509	979,126	757,261	17,207			23,789	180,238	631
1888	4,415,381	798,673	614,214	13,468			5,226	164,329	1,431
1889	1,780,765	331,958	174,027	7,879			22,921	124,349	2,782
1890	1,951,585	340,131	184,105	5,059			29,342	119,989	1,636
1891	3,768,101	602,175	440,060	10,054		20,447	24,021	101,649	5,944
1892	5,736,696	1,056,058	877,455	6,038		5,160	27,207	133,770	6,428
1893	7,036,013	1,296,814	1,118,614	7,539		1,175	35,042	127,412	7,032
1894	5,534,621	1,095,588	936,422	6,048	1,125		25,560	109,263	14,170
1895	3,650,258	697,476	536,797	5,365		267	35,028	108,439	11,580
1896	5,889,241	1,052,089	893,053	2,729		9,370	34,299	105,472	7,166
1897	11,453,351	2,089,173	1,912,389	6,233		8,513	33,490	115,754	12,794
1898	11,253,787	2,046,686	1,915,550	3,738		17,574	31,619	51,045	27,160
1899	20,139,195	3,700,873	3,526,007	3,984		12,384	41,810	74,813	41,875
1900	25,259,737	5,122,156	4,947,000	5,044		7,210	43,176	66,069	53,657

CHEESE.

Year.	Quantity.	Value.	To Great Britain.	To United States.	To France.	To Germany.	Other Foreign Countries.	B.N.A. Provinces.	British Indies.
	Lbs.	$	$	$	$	$	$	$	$
1868	6,141,570	620,543	548,574	68,784			891	1,954	340
1880	40,368,678	3,893,366	3,772,769	114,507			170	5,710	210
1881	49,255,523	5,510,443	5,471,362	28,500			14	10,027	540
1882	50,807,049	5,500,868	5,571,076	18,436			242	8,196	2,318
1883	58,041,387	6,451,870	6,409,859	24,468			202	15,490	1,863
1884	69,755,423	7,251,989	7,207,428	24,866			188	19,248	262
1885	79,655,367	8,265,240	8,178,953	86,978			205	15,899	1,207
1886	78,112,927	6,754,626	6,729,134	15,478	80	90	156	9,139	546
1887	73,604,448	7,108,978	7,065,983	30,667			211	11,982	165
1888	84,173,267	8,928,242	8,834,997	83,153	5		828	9,087	172
1889	88,534,887	8,915,684	8,871,205	31,473			1,582	11,208	216
1890	94,260,187	9,372,212	9,349,731	6,425		370	2,154	12,777	755
1891	106,202,140	9,508,800	9,481,373	13,485			1,954	9,104	3,884
1892	118,270,052	11,652,412	11,593,690	39,558	2		2,124	12,942	4,096
1893	133,946,365	13,407,470	13,360,237	23,578			2,689	18,679	2,297
1894	154,977,480	15,488,191	15,439,198	9,552		173	3,036	21,948	14,284
1895	146,004,650	14,253,002	14,220,505	5,058		16	5,463	9,785	12,175
1896	164,689,123	13,956,571	13,924,672	10,359	299		4,861	7,509	8,871
1897	164,220,699	14,676,239	14,645,859	4,486	94	24	5,365	11,954	8,457
1898	196,703,323	17,572,763	17,522,681	14,604		1,428	6,889	12,784	14,377
1899	189,827,839	16,776,765	16,718,418	17,739			11,701	13,293	15,614
1900	185,984,430	19,856,324	19,812,670	4,836			8,774	16,651	13,393

IMPORTS OF GREAT BRITAIN.

The following table from the Board of Trade returns of Great Britain for thirteen years (ended December 31), shows the total quantities and value of butter and cheese imported into Great Britain :—

BUTTER.			CHEESE.		
Year.	Quantity.	Value.	Year.	Quantity.	Value.
	*Cwt.	£ stg.		*Cwt.	£ stg.
1886	1,543,566	8,141,438	1886	1,734,890	3,871,359
1887	1,513,134	8,010,274	1887	1,836,789	4,514,382
1888	1,671,433	8,913,045	1888	1,917,616	4,546,408
1889	1,927,842	10,244,636	1889	1,907,999	4,490,970
1890	2,027,718	10,598,848	1890	2,144,074	4,975,134
1891	2,135,607	11,591,181	1891	2,041,317	4,815,369
1892	2,183,009	11,965,190	1892	2,232,817	5,416,784
1893	2,327,474	12,753,593	1893	2,007,462	5,160,918
1894	2,574,835	13,456,699	1894	2,226,145	5,474,940
1895	2,825,662	14,245,230	1895	2,133,819	4,675,130
1896	3,037,718	15,344,364	1896	2,244,525	4,900,342
1897	3,217,802	15,916,917	1897	2,603,178	5,885,521
1898	3,209,153	15,961,783	1898	2,339,452	4,970,805
1899	3,389,851	17,213,516	1899	2,384,069	5,503,004

*Cwt. = 112 lbs.

CROPS.

In most of the provinces of the Dominion farmers have realized during the past year good returns for their labour. In some localities, however, particularly in parts of the North-west country, the season has been less favourable.

In the maritime provinces the spring was very backward, so that seeding in a general way was delayed until after the middle of May. Nevertheless, the crops have turned out well, the yield of oats is exceptionally heavy, spring wheat and barley have also done unusually well. Pease have scarcely given an average crop, but Indian corn has made good returns. Field roots and potatoes have given unusually heavy crops. Hay was a fair crop, of good quality, and was well saved.

Fruit in the Annapolis valley and in other parts of Nova Scotia, also in some sections of New Brunswick and Prince Edward Island, turned out well. The home markets have been well supplied, and large shipments of apples have been made from Nova Scotia to Great Britain.

In Quebec the hay crop is said to be below the average, but of excellent quality. Oats have given more than an average yield. Spring wheat has also done well, while barley, buckwheat and pease have given fair returns. The harvest weather has been favourable. Field roots and potatoes have produced abundantly. Indian corn has given fair returns, and pasturage, especially during the latter part of the season, has been good.

In the south-eastern part of the province fruit has yielded well, and in the newer settlements in the north-western section of Quebec excellent crops have been had.

The farmers of Ontario have had good crops. Fall wheat, of which there was a larger acreage than usual, has given more than an average return. Spring wheat, barley and oats have all given crops considerably larger than the average of past years. These have been well saved, but the straw, owing to dry weather in the spring, is unusually short. Pease and beans have also gone above the average in yield. Rye has givn a fair return, while buckwheat has fallen below the average. Field roots have given good crops, averaging higher than last year. The crop of Indian corn has been a medium one, while hay, owing to a drought in the spring, has given less than the usual return. Potatoes have given the largest yield had in many years.

The crop of fruit has been unusually good. Small fruits were abundant, peaches and grapes unusually plentiful; pears and plums a fair crop, and apples an abundant one.

In the province of Manitoba a severe drought prevailed during the spring months, which interfered with the prompt germination of seed. Early in August, when the grain was nearly ripe, wet weather set in and interfered with harvesting for some weeks, and in some cases causing the grain to sprout. In many instances the outcome has been disappointing, an inferior crop, with but a small proportion of wheat of high grade. The hay crop, owing to spring drought, was very light, but the later rains produced a heavy aftermath, giving abundant pasture. Late maturing grain crops were very heavy, but many of them were not fully ripe when frost came. Such oats and barley as escaped injury from bad weather gave good crops, but of other varieties the returns are light.

Indian corn gave a good yield, while field roots gave about half the usual returns. The potato crop was a satisfactory one, and above the average.

In the North-west Territories the season was also unfavourable. Like Manitoba, the Territories suffered from drought in the early part of the season, and later on from too much rain. There was very little rain in the early part of the year, and strong winds injured the crops and such grains as escaped injury from wind, ripened with very short straw. When the grain was about fully ripe there were frequent rains, which protracted the harvest season and made it more laborious and expensive than usual. Grain sown later to replace exposed portions of fields injured by winds produced a very heavy growth of straw, but the grain, in some instances, did not mature. The sheaves, however, cut, will make excellent food for stock.

In some limited sections the conditions were much more favourable, and fair crops of grain were realized. Barley as a rule was less injured than wheat. Indian corn was a fair crop. Field roots gave less than an average return, but potatoes were an excellent crop, giving large yields of tubers of fine quality. The hay crop was a light one, but the later rains produced great growth, and the pastures were excellent. Trees and shrubs and flowers made an unusually strong and vigorous growth. Stock in every part of the Territories has done remarkably well during the past season.

Farmers in the coast climate of British Columbia have as a rule had fair crops of oats, barley and wheat, in many instances well up to the average. Pease also were a medium crop, while Indian corn gave more than an average return. The early part of the spring season was cold and wet, and the seeds of field roots did not germinate evenly, but those which were earliest sown have given very fair returns, and in some instances the crop has been heavy. Potatoes have given good yields, well up to the average. Cut worms have been unusually abundant, not only in the coast climate, but also in the interior of British Columbia, and in the adjoining states of Washington and Oregon. They injured the grain to some extent, and devoured some of the growing fruit.

Grain in the interior of British Columbia has given satisfactory returns; the crops of fruit have also averaged well. Fruit in the coast climate promised well early in the season, but cut worms and protracted wet weather during the ripening period reduced the yield considerably. Hay has given an excellent return, and small fruits have yielded well.

CATTLE TRADE

FOR YEAR ENDED SEPTEMBER 30.

IMPORTATION OF LIVE STOCK.

The importation of horses and mules, cattle, sheep and swine into the Dominion reported during the past season was as follows :—

Horses and mules	11,755
Cattle	2,834
Sheep	46,170
Swine	1,584

The above were brought in at various points as shown in detail in the reports of the Chief Veterinary Inspector (See Appendix No. 13).

EXPORTATION OF LIVE STOCK TO EUROPE.

The exportation of live stock from Canadian ports for the year ended September 30, 1900, was as follows :—

Horses	5,044
Cattle	115,056
Sheep	79,254
Swine	Nil.

EXPORTATION OF CATTLE TO THE UNITED STATES.

The numbers of Canadian cattle exported to the United States during the four previous years, were as follows :—

1896	1,646
1897	57,857
1898	88,605
1899	85,240
1900	86,989

EXPERIMENTAL FARMS BRANCH.

The many branches of useful experimental work conducted so successfully at the Central and branch farms have been vigorously carried on during the past year, and much general information has been disseminated among the farmers of this country, The increasing demand for the reports and bulletins published by the farms, and the many individual inquiries by letter for information on farm subjects, indicate an appreciation of the work and a desire to profit thereby. The services of the several officers have been much in demand, and many of the more important agricultural and horticultural meetings have been attended in different parts of the Dominion, every province and territory being more or less visited.

AGRICULTURE—EXPERIMENTAL DIVISION.

TESTING OF FERTILIZERS.

The researches in connection with this division of the work have been pushed forward with much energy. The testing of the action of fertilizers on crops has been continued and many new experiments inaugurated. Further evidence is forthcoming to establish the economy of using barn-yard manure in its fresh or green state as a fertilizer, and additional demonstrations have been made as to the great usefulness of green clover when ploughed under, adding fertility to the soil, improving its texture and mechanical condition, and increasing its power to hold moisture. The practice carried out at the farms of sowing clover with spring grain crops, and ploughing the crop under late in the autumn, is rapidly growing in favour with the farming community, and is being adopted in many cases with the best results.

EXPERIMENTS WITH FARM CROPS.

Further trials have been made to test the relative earliness and productiveness of a large number of varieties of the more important farm crops, and some promising new sorts have been introduced, including several which have lately come into cultivation in Great Britain, and some additional cross-bred sorts which have been produced at the experimental farms. As soon as the particulars of the crop could be ascertained, a special bulletin was issued which was distributed widely among the farmers of the Dominion, and the information gained was thus placed in their hands in good season.

Under my instructions the Director of Experimental Farms visited the Paris Exposition during the summer, and examined the agricultural exhibits of other countries with the object of obtaining promising sorts of farm products for test in Canada. In this he has been successful, and samples of a number of varieties not hitherto tried here have been secured, particularly of wheat, oats, barley and rye, from the exhibits made by Russia, France, Sweden, Algeria and Roumania. These will be included in the test plots next season. The Director also visited agricultural colleges and experiment stations in Great Britain and France, where he gained much information and secured further supplies of interesting agricultural and horticultural material for testing on the experimental farms here.

DISTRIBUTION OF SEED GRAIN, &c.

The interest manifested by the farming community in the past in the annual distribution of samples of promising varieties of seed grain is unabated, and the demand for such material for the improvement of seed has been large. Under my instructions such arrangements were made as resulted in supplying sample bags to all those who applied before March 15, which was the limit of the time given during which applications would be received. The varieties which have been sent out are mainly those which have shown the greatest vigour and productiveness in the comparative trials which have been made at the experimental farms.

The new feature introduced in connection with this distribution, referred to in my last annual report—that of sending to a limited number of the most careful farmers residing in different parts of the Dominion a sufficient quantity of seed to sow one-tenth of an acre of land has worked well. The farmers who were selected to carry out this work have taken much interest in the subject, and have in most instances compiled, and returned the particulars asked for, with much promptness. By this means, useful information has been gained as to the relative yield per acre in all the climates of the Dominion, of the special sorts sent out. Arrangements are being made to have this section of the work continued.

HARDY FRUIT, FOREST TREES AND SHRUBS FOR THE NORTH-WEST PLAINS.

Packages of root grafts of some of the most promising of the new cross-bred hardy crabs, which have been produced at the Central Farm during the past few years, were distributed last spring to the branch Experimental Farms, also to about forty farmers and fruit growers living in different parts of the north-west country.

Although the severe spring drought which prevailed there this year was unfavourable for the growth of the young trees, a considerable measure of success has attended this effort. Preparations are being made for another limited distribution of this sort during the coming season. Such additional varieties of hardy trees and shrubs as were obtainable have been sent to the branch farms at Brandon and Indian Head, to be thoroughly tested as to their useful qualities in those districts. The direct and striking evidence which was afforded this year, especially at Indian Head, of the usefulness of such forest tree plantations as shelter belts and hedges in protecting grain crops from the destructive action of strong winds, was very gratifying. Farmers are gradually being led by the many object lessons given them to pay more attention to the importance of providing more tree shelter on their prairie farms.

GENERAL AGRICULTURE.

The 200 acres of land on the Central Experimental Farm, which was referred to in my report last year as having been set apart for a regular rotation of crops, has been worked this year to more advantage. The land has been much improved by enlarging and extending the system of drainage, which was much needed. Additional fencing has also been provided to permit of the stock being pastured in different parts of the land each year. Particulars of the crops obtained, and the cost of growing them, will be found in the report of the agriculturist of the Central Farm for 1900.

DAIRY WORK.

The dairy herd of cattle has been further improved by the addition of several pure-bred animals. Some experimental work has also been carried on in reference to the influence which the use of certain foods have on the proportion of butter fat in the milk.

STEERS.

Further experiments have been conducted to gain information as to the most economical methods of feeding steers, also as to the influence which the operation of dehorning has on the fattening of the animal.

SHEEP.

The flock of sheep has been considerably increased, and experimental work is being continued to gain information as to the influence of pure-bred sires on grade ewes in improving the stock.

SWINE.

Many experiments have been made in connection with the feeding of swine with the object of finding the cause of soft bacon, also to determine the rapidity of the growth of the animal under different rations. The breeding stock has also been much improved by the purchase of additional pure-bred animals of the best types.

DIVISION OF HORTICULTURE.

The chief work of the Horticultural Division is the testing of fruits to determine their relative hardiness, quality, productiveness and freedom from disease. In conjunction with this work, however, different ways of propagating and grafting fruits are tried, and different methods of cultivation adopted in the orchards. Much work has also been done to determine the best cover crops to protect the roots of the trees in winter, and to improve the soil when ploughed under. The spraying of the trees also receives attention. In addition to the work carried on with fruits, considerable time is devoted to the testing of vegetables and tobacco. The Arboretum and Botanic Garden and the forests are also included in the Horticultural Division.

Fruits.—The year 1900 was a good fruit year at the Central Experimental Farm. A large number of varieties of apples, plums and strawberries fruited which had not done so before, affording material for studying their relative merits. Every year's experience makes the experiments with the different fruits more valuable, as the average results will be a better guide to the real value of the varieties tested. Few varieties of winter dessert apples are hardy at Ottawa when grown from root grafts in the ordinary way, as the trunks either sun-scald or the roots are killed by winter. Experiments were continued this year in the top grafting of a large number of these tenderer varieties on trees which are perfectly hardy at Ottawa, and the results so far justify the conclusion that some varieties, at least, can be grown here successfully in that way which might otherwise prove tender. Much attention has been given to the cultivation of the American plums, and a large number of improved varieties of these are now being grown. Few varieties of European plums are hardy at Ottawa, and as some of the American sorts are of good quality and nearly all quite hardy, they will be very useful in districts where the European plums cannot be grown. A large number of new varieties were added to the collection this year.

Vegetables.—While more attention is paid to the testing of fruits, vegetables are not neglected. They form an important article of diet, and the growing of them gives a means of livelihood to many, therefore, information regarding their season, quality, productiveness, &c., should prove useful. A large number of varieties were again tested this year, and many notes taken on their relative merits and productiveness.

Cover Crops.—The importance of growing cover crops in orchards is becoming more apparent every year. The disastrous results of the winter of 1898-99, in the destruction of trees from root-killing, in fruit districts in south-western Ontario, impressed on fruit growers the need of more protection for the roots of fruit trees in winter. Since 1895, much attention has been given to cover crops at the Central Experimental Farm. Different kinds of plants have been tried for this purpose, and different ways of treating them have been followed. Common Red or Mammoth clover make the best cover crops where they can be grown successfully. The trees in the orchard at the farm are well protected with clover this autumn.

Spraying.—Thorough spraying of the fruit trees was continued this year, and the good results were apparent. Experiments were continued this season in testing the value of a spray of lime and water in removing the oyster-shell bark-louse from apple trees. Additional evidence was obtained of the value of the mixture for this

purpose. The value of a lime wash as a remedy for this destructive insect was first discovered by the horticulturist of the Central Experimental Farm.

Arboretum and Botanic Garden.—The trees, shrubs and herbaceous plants in the arboretum made very satisfactory growth this year, owing to the favourable season. Many additions were made to the collections, which are now very large. The value of this branch of the work of the Horticultural Division is becoming more apparent every year, as a better knowledge is obtained of what can be grown successfully in this part of Canada.

DIVISION OF ENTOMOLOGY AND BOTANY.

The services of the Entomologist and Botanist during the past season have been in constant demand, and he and his assistants have been kept busy in the carrying out of many experiments connected with the life histories of injurious and beneficial insects, and the nature of weeds and other plants. The increased demand for information from the division is very satisfactory, and is attested by the large number of inquiries received; without counting circulars and personal applications, 3,017 letters demanding replies came to hand during the year. Considerable progress has been made in arranging the collections of plants and insects. Specimens which have been on hand for several years have been mounted and put in place for exhibition in the additional room which has been put at the disposal of this division. Some cases showing the complete life histories, in all stages, of several insects, have been prepared, as well as a collection of beautifully inflated caterpillars, presenting them in a permanent shape, showing their form and colours as in life. These collections are now an attractive feature to students and visitors, and will become more so as further additions are made.

Among the insects which have demanded special attention during the season are the following :—

The San José Scale.—The establishment of Fumigation Stations for the treatment of nursery stock so as to prevent any further introduction of the San José Scale into Canada was placed in charge of the Entomologist, and has taken up some time. Unfortunately it would appear as though the San José Scale has increased in numbers in the districts which were known to be infested last year, and the pest has spread somewhat into adjacent localities. Several experiments are being tried in the hope of getting a practical remedy.

The Hessian Fly.—A serious outbreak of the Hessian Fly has to be recorded in Western Ontario, but in Manitoba where last year the summer brood destroyed a very large percentage, in some places amounting to one-quarter of the crop, of spring wheat, hardly any injury is reported this year.

Locusts.—An outbreak of locusts following a very dry spring was the cause of serious loss in Southern Manitoba in June last. The Entomologist, under my instructions, visited the worst localities in company with the Chief Clerk of the Department of Agriculture, Manitoba, and advised farmers as to the best steps to follow.

The Variegated Cut-worm.—The caterpillar of one of the owl-let moths, named *Peridroma saucia* did enormous harm throughout the province of British Columbia

in July and August last, extending over the whole of the coast districts, up through the interior, even high up into the mountains, in fact wherever there were cultivated crops. Prompt advice was at once sent from the division and widely distributed by the Deputy Minister of Agriculture for British Columbia.

The Spotted Cut-worm, *Noctua C-nigrum*, a closely allied insect was also abundant about the same time in Ontario destroying all classes of succulent crops.

The pea crop was assailed by three destructive enemies, the Pea Weevil which year by year is the cause of a great loss to the country, notwithstanding the fact that a practical remedy is well known. The Entomologist has endeavoured to stir up farmers to adopt the simple remedy of fumigation with carbon bisulphide to a much larger extent than has been done in the past. The pea moth has been more abundant than usual in Quebec and Ontario. Experiments are being tried for a practical remedy, and rather hopeful results have been obtained, which will be further investigated next year. The Destructive Pea-Aphis which was treated of in the last report of the Entomologist has again appeared this year on pease and clover. Although the injury has not been quite so extensive in Canada as last year, the destruction in the United States by this pest has been enormous.

The investigations as to the value of native grasses and other fodder crops have been continued, also studies of noxious weeds and the comparative value of various remedies for injurious insects.

During the Director's absence attending the Paris Exposition, it became necessarily increased to a considerable extent the work of himself and his assistants.

Several meetings have been attended and addresses delivered upon the best methods of preventing or meeting insect injuries, upon weeds and their eradication, as well as upon other matters coming within the scope of the Division of the Entomologist and Botanist. During the month of July at the request of the government of the North-west Territories the Entomologist held a series of twelve meetings in the Prince Albert district, where addresses were delivered upon weeds and kindred subjects.

DIVISION OF CHEMISTRY.

Since chemical aid is needed in every branch of agriculture, the work of this division necessarily covers a very wide field. Though original investigations and research work in connection with experiments instituted at the Experimental Farms have received first attention, a very large amount of direct and immediate help has been given to farmers by means of correspondence, analysis of samples, and by lectures.

The chief features of the work for 1900 may be enumerated as follows:—

Soils.—Complete analyses of soils from irrigated and non-irrigated areas in the North-west Territories have been made, and the results of this investigation will appear in the forthcoming report of the Chemist. The question involved is whether irrigation increases or diminishes fertility, or, to speak more correctly, the amount of plant food, and the data obtained will furnish some interesting information towards the solution of that problem.

Samples, also from the North-west Territories, of virgin prairie soil and soil from a closely adjacent area which had been cropped for a number of years, but not manured, have been critically examined. This research was undertaken to learn the extent to which the rich soils of the North-west may become impoverished by the common method of continuous cropping without manuring.

The soil and sub-soil representative of the larger part of the area lying between the Fraser river and Burrard inlet, B.C., have been examined with a view to learning their characteristics and deficiencies, and thus be in a position to assist the farmers and fruit growers settled there by suggestion as to the most profitable fertilizers to use.

The question of the conservation of soil moisture, as affecting the lands of Manitoba and the North-west Territories, has been the subject of an extensive investigation carried on through assistance rendered by the Superintendents of the Experimental Farms of those provinces month by month from May to November, the amounts of water have been determined, by analysis, in the surface soil and subsoil of cropped and fallowed land, respectively, and most instructive and interesting data have been obtained. The conservation of soil moisture by cultural methods is a question of the utmost importance to agriculturists in the North-west.

A study of the development of the nitrates in these North-western soils has also been made. This was instituted to learn how far the statement that loss of nitrates occurred through leaching was correct.

Though valuable results have been arrived at, in these soil studies, it will be necessary to continue the prosecution of many of them over several summers, in order to ascertain the effect of varying seasons.

Fodders and Feeding Stuffs.—The growing importance of rape as a fodder crop made it desirable that we should know at what stage of growth it is most nutritious. Accordingly, this plant has been submitted to analysis at periods of growth, varying from 10 to 100 days.

A number of newly introduced legumes grown at the Central Farm under the care of the Botanist have been analysed, and their nutritive value ascertained. They include the famous Lathryus sylvestris Wagneri, Canada Wild Pea, Grass Pea and others.

Numerous feeding stuffs, among which are samples of cotton seed meal, bran, cocoanut cake, have also been examined and reported upon.

Many of the more popular varieties of mangels, carrots, turnips and sugar beets have been analysed and their relative feeding value established, furnishing useful information for the guidance of stock feeders.

Naturally-occurring Fertilizers.—Samples of marl, muck and naturally-occurring substances having a manurial value, and collected in various parts of the Dominion, have been examined.

Well Waters.—This work has been continued, and about seventy-five samples from farm homesteads and dairies have been tested during the past year.

Soft Pork Investigation.—A very large portion of the time of the Chemical staff has been spent on this useful and important research. The fatty tissue of more than

200 pigs, fed in pens of six to ten animals, with various rations, has been submitted to a careful chemical examination. This investigation is still in progress, but already results of the greatest value, as showing the effect of different feeding stuffs on the quality of the pork, have been obtained. Since the bacon export trade to England is rapidly increasing, and since the English market demands a 'firm' bacon, the importance of this investigation is obvious.

Sugar Beets.—Analyses, as to sugar-content and purity, have been made of sugar beets grown in Manitoba, North-west Territories and Prince Edward Island. This investigation was undertaken to supplement the data already obtained in the farm laboratories on sugar beet culture in Canada.

The analytical data referred to in connection with the foregoing investigations, together with the deductions therefrom, will be found in the report of the Chemist of the Experimental Farms for the current year.

Tuberculin.—During the twelve months ending October 31, 1900, 20,280 doses of tuberculin have been prepared and forwarded by this division to the Government Veterinary Inspectors. In the preceding year for the same period 17,179 doses had been sent out.

POULTRY DIVISION.

In the poultry department experiments were conducted during the winter in the feeding of certain rations and noting their effect on egg production during that period. Investigation into the drawbacks to early successful spring hatching by natural and artificial means was also made, and in connection therewith the effect, on the laying stock, of their artificial life and treatment during the cold period from December to April. Experiments were also conducted in the fattening of a number of thoroughbred and half-bred cockerels. The data obtained showed that the best results were obtained in from three to four weeks, and that while some crosses did well, that best results were obtained from thoroughbreds of the larger breeds.

EXPERIMENTAL FARM FOR THE MARITIME PROVINCES.

The experimental work in progress for some years past has been continued with a large number of varieties of different sorts of farm products, including the more important cereals, field roots and fodder crops, to ascertain which of these produce the heaviest crops. Many samples of the seed of the most promising varieties grown at the Nappan farm have been sent out for test to farmers residing in different parts of the Maritime provinces.

The excellent dairy herd which has been brought together here has been well maintained. It now consists chiefly of pure bred Ayrshires and Guernseys and Ayrshire grades, accounts are kept of the cost of feeding these animals and of the revenue derived from the sales of milk, which are published from year to year in the report of the Superintendent. Many steers have also been fed to determine the cost of the production of beef with the rations used, also as to the effects of dehorning steers. Additional experiments have been made to gain information as to the most economical methods of producing pork.

Further trials have also been had with fruits and vegetables to find out what sorts are best adapted to the climate of the Maritime provinces, also to determine the quality and usefulness of the different sorts under trial.

Additions and improvements have been made to some of the farm buildings. A new horse stable has been erected, and the former stable refitted. A part of it has been devoted to increased accommodation for steers and part of it to sheep. An additional root-house has also been provided.

Many meetings of farmers have been attended during the year by the Superintendent and Horticulturist, in Nova Scotia, New Brunswick and Prince Edward Island, when fuller explanations have been given of the work being done at the Nappan Experimental Farm.

EXPERIMENTAL FARM FOR MANITOBA.

This farm continues to be very helpful to the settlers in Manitoba, and stands high in the favour of the community. A large number of farmers visit this institution every year to gain instruction from the object lessons afforded there. The Superintendent also attends many meetings of farmers during the winter months, when opportunities are given of explaining more fully the various lines of work in progress.

Further trials have been made at this farm of different methods of cultivation for crops, and a large number of experiments conducted with different varieties of the more important farm crops, with the view of finding out which are the most profitable sorts to grow in this climate. Many experiments have also been made with grasses suitable for hay and pasture.

Experiments have also been conducted with rye, flax, millets, soja beans, garden vegetables and with many different sorts of rhubarb. Fruits also of many kinds have been further tested, and on all these subjects much useful information has been gained.

Some experiments have been made in the feeding of swine, also in the fattening of steers to ascertain the most economical methods of using the various kinds of fodder grown in Manitoba. Tests have also been made of the effects of the dehorning of steers. Experiments in the fattening of poultry have been continued, planned to meet the conditions of the average Manitoba farmer. The care of bees in this climate has also been the subject of further study and experiment.

The rapid growth of the forest trees on this farm, planted in windbreaks, avenues and hedges, adds very much to its attractiveness, and is proving a great incentive to tree planting for shelter on the farms of that province. Some promising sorts of young forest trees and shrubs have been distributed for test among the farmers of Manitoba, many samples of promising sorts of grain and potatoes have also been sent out for trial.

EXPERIMENTAL FARM FOR THE NORTH-WEST TERRITORIES.

The good work conducted for some years past in testing all sorts of agricultural products, likely to prove useful in the North-west country, has been continued. The season has been unfavourable for some of these crops, while others have done fairly well. Much attention has been given at this farm for many years to experiments in the summer-fallowing of land to find out the best method for the treatment of the land, to secure the most satisfactory results. This is a most important subject to farmers in the North-west country. During the past year some conclusions have been reached, based on the long experience had on the Experimental Farm, as to the best methods to adopt, the particulars of which will appear in the report of the superintendent for 1900. Experiments with different plans for a rotation of crops have been continued.

Experiments have been carried on with the dehorning of steers to ascertain what effect this operation has on the feeding of these animals in the North-west country.

Many samples of the most promising sorts of grain grown in the Experimental Farm have been distributed among the settlers in the Territories for trial. A considerable distribution has also been made of sample bags of the seed of Brome grass, also of tree seeds and many packages of young trees and shrubs have been sent for trial to different parts of the country. Further experience has been had with trials of many different sorts of vegetables, also with such ornamental trees, shrubs and plants as are likely to prove hardy in that country.

The cattle on this farm which consists chiefly of Shorthorns and Shorthorn and Ayrshire grades are all in good condition. The bulls kept for service are Shorthorn, Ayrshire and Guernsey. These have been found very useful to farmers in that part of the country for the improvement of their stock.

During the year the Superintendent has visited many parts of the Territories, has attended and addressed meetings of farmers, and has thus become more fully acquainted with the needs of the settlers in different parts of the immense area comprised in the North-west Territories.

EXPERIMENTAL FARM FOR BRITISH COLUMBIA.

The work on this farm is making satisfactory progress. A considerable acreage of land has been chopped and brushed during the year, and the clearing on a good portion completed and the land brought under the plough. Arrangements made by me last year for the opening of surface drains from the lower parts of the land on this farm into a public ditch has worked satisfactorily; a large quantity of surface water has been removed, which will permit of nearly all that part of the farm being eventually brought under cultivation.

The fine orchards of fruit, which are a special feature of the work here, are making excellent progress. The trees are growing rapidly and many of the varieties coming into fruit. As these different sorts come into bearing, descriptions are taken as to the character and quality of the fruit, the particulars of which are published from year to year in the reports of the Superintendent. During the past year a complete list has been published of all the varieties of large fruits which are now under

trial at Agassiz, numbering 2,582 varieties in all. In this publication descriptions are given of the character and quality of all the different sorts which have borne fruit at Agassiz. These lists have been distributed among the settlers and will no doubt be very useful to those who are making new plantations of fruit trees.

The orchards planted on the sides of the mountain in rear of the farm are doing remarkably well, the trees are making a rapid and healthy growth, and many of them are coming into bearing.

Further experience has been gained by continuation of experiments with many different varieties of wheat and oats, also of barley, pease, Indian corn, field roots and potatoes, also with grasses and clovers, flax, millets, soja beans, horse beans. Many garden vegetables have been tested, and the particulars recorded by the superintendent in his yearly report. These records have proved a useful guide to many of the settlers in that province.

Many meetings of farmers and fruit growers have been attended during the year by the Superintendent of the Farm, where opportunities have been afforded of explaining more fully the details of the many important lines of work in progress.

ARCHIVES.

The work of this branch continues to be carried on systematically and with strict regard to economy. Many of the papers summarized in the calendar of this year's report show the incidents that preceded the political disturbances in Lower and Upper Canada, headed in the one case by Mr. L. J. Papineau and in the other by Mr. W. L. MacKenzie.

III.—PATENTS OF INVENTION.

The following comparative tables show the transactions of the Patent Branch of the Department of Agriculture, from the calendar year 1888, to the year ending October 31, 1900:—

Years.	Applications for Patents.	Patents and Certificates Granted.			Caveats.	Assignments of Patents.
		Patents.	Certificates.	Total.		
1888	2,747	2,257	282	2,539	240	1,159
1889	3,279	2,725	356	3,081	221	1,437
1890	3,560	2,428	369	2,797	248	1,307
1891	3,233	2,343	393	2,736	215	1,231
1892	3,176	3,417	415	3,832	242	1,500
*1893	2,614	3,153	292	3,445	229	1,345
1894	3,291	2,756	462	3,218	301	1,445
1895	3,387	3,074	422	3,496	343	1,550
1896	3,728	3,488	413	3,901	306	1,420
1897	4,300	4,013	284	4,297	377	1,551
1898	4,200	3,611	262	3,873	363	1,657
1899	4,305	3,151	412	3,563	311	1,467
1900	4,628	4,522	482	5,004	283	1,914

* For 10 months only.

Detailed Statement, Patent Office Fees.

Years.	Patents.	Assignments.	Caveats.	Copies.	Subscription to *Patent Record.*	Notices to Apply for Patent.	Sundries.	Totals.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1888	60,436 78	2,562 22	1,257 40	971 98			18 13	65,246 51
1889	72,411 30	3,027 90	1,205 47	1,267 60			134 45	78,046 72
1890	78,192 61	3,202 00	1,320 15	931 83			504 19	84,150 78
1891	72,664 26	2,411 95	1,124 60	782 29			340 53	77,723 63
1892	71,840 84	2,794 66	1,270 13	793 32	236 52	89 96	195 33	77,216 76
1893	58,441 81	2,633 71	1,244 70	796 15	285 18	337 81	110 73	63,850 19
1894	73,061 77	3,142 74	1,793 40	764 07	347 21	1,449 80	123 57	80,682 56
1895	78,223 52	3,194 00	1,854 35	761 54	245 98	1,951 30	129 79	86,358 48
1896	85,060 61	3,130 56	1,790 65	898 27	420 60	2,245 79	57 04	93,532 52
1897	93,298 16	3,250 23	2,108 57	969 33	252 53	2,110 89	128 21	102,117 92
1898	91,176 44	3,641 00	1,935 74	706 50	266 44	1,463 10	172 73	99,361 95
1899	98,669 92	3,781 71	1,533 25	1,028 80	198 05	1,912 00	137 83	107,261 56
1900	104,848 96	4,255 40	1,405 00	932 54	552 71	1,742 70	115 15	113,852 46

* For 10 months only.

The Patent Office fees received during the year ended October 31, show a surplus of $68,284.65 over the working expenses of the office as per subjoined table.

Receipts.	$ cts.	Expenditure.	$ cts.
Cash received	113,852 46	Salaries	31,134 59
Cash refunded	2,520 88	*Patent Record*	11,912 34
			13,046 93
		Receipts over expenditure	68,284 65
Net cash	111,331 58		111,331 58

The following is a table of the countries of residence of the patentees for the years named :—

Countries.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.
Canada	565	609	620	606	671	685	661	707	740	756	710	601	707
England	152	203	116	122	298	206	177	179	215	266	261	205	254
United States	1,425	1,788	1,623	1,519	2,227	2,061	1,731	1,980	2,270	2,666	2,312	2,038	3,216
France	21	18	10	10	26	24	24	21	24	26	39	36	40
Germany	33	51	23	36	166	88	108	102	117	126	124	112	157
Other countries	61	56	36	50	89	89	55	85	122	173	165	159	148
Total	2,257	2,715	2,428	2,343	3,417	*3,153	2,756	3,074	3,488	4,013	3,611	3,151	4,522

The Canadian patentees were distributed among the provinces of the Dominion as follows :—

Provinces.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.
Ontario.....	354	383	425	394	464	437	404	451	430	464	383	310	396
Quebec	128	129	125	140	131	151	162	177	201	178	171	140	164
New Brunswick	19	22	20	16	19	23	13	13	12	20	26	7	14
Nova Scotia....	35	30	17	22	16	29	15	19	32	22	27	18	21
Prince Edward Island..	2	2	3	1	1	3	2	6	2	2	4	8	1
Manitoba and the North-west Territories....	18	32	14	28	22	26	38	18	28	36	45	50	42
B. Columbia....	9	11	16	5	18	16	27	23	35	34	54	48	69
Total.....	565	609	620	606	671	*685	661	707	740	756	710	601	707

* For 10 months only.

Statement of the number of Patents issued under the Act of the session of 1892, 55-56 Vic., chap , 24, on which the fees are paid for periods of six, twelve or eighteen years, at the option of the patentee ; and of patents on which certificates of payments of fees were attached after the issue of Patents originally granted for periods of five and ten years.

Years.	Periods for which the Fees were paid on first issue.			Patents on which Certificates were attached after issue.			
	6 yrs.	12 yrs.	18 yrs.	6 yrs.	12 yrs.	5 yrs.	10 yrs.
1892 (Six months ended December 31).....	2,141	3	35	. . . .	3	387	25
1893 (Ten months ended October 31).....	3,098	9	46	. . . .	3	279	10
1894 (Twelve months ended October 31)....	2,701	9	46	. . . .	4	433	25
1895 " " ...	3,049	5	20	. . . .	....	416	6
1896 " " ...	3,443	11	34	2	.....	401	10
1897 " " ...	3,981	8	24	15	3	262	4
1898 " "	3,586	3	22	176	9	77	0
1899 " " ...	3,125	3	23	291	13	108	0
1900 " "	4,489	4	29	366	21	101	0

It will be found in the preceding tables that the total revenue for the year is $113,852.46, being the largest in the history of this branch of the department, resulting in an increase of $6,590.90 over the preceding year and a surplus of $68,284.65 over the expenditure.

As in previous years, the larger proportion of applications for patents came from inventors resident in the United States, to whom were granted 3,216, over 71 per-centum of the whole issue.

The number of petitions under section 37 of The Patent Act, in which satisfactory reasons were shown to justify the granting of the importing privilege, was 1,276, and of the manufacturing privilege 2,966, or an increase over the preceding year of 205 and 562 respectively.

The total number of reports issued by the examiners during the year was 6,161.

It is in the interest of both the applicants and the office that great care should be taken by applicants in the preparation of the papers which are required by the rules and forms. Copies of these are furnished gratuitously to all applicants, and the directions in them should be closely observed.

Patentees who are resident in foreign countries continue to avail themselves of the privilege granted under section 8 of The Patent Act, by giving notice to the Commissioner of intention to apply for patents in Canada. The number of these notices registered during the year was 1,011, yielding a revenue of $2,022.

The 'Canadian Patent Office Record' continues to be published monthly. It contains a transcript, with drawings, of all claims of patents granted, dates of filing, dates of issue, and length of term for which granted; together with the names and residences of patentees. It also contains a list of registered copyrights, trade marks and designs. This publication is found to be of great and increasing value to all who are interested in patents. It affords convenient and easy reference to the claims of all patents granted in Canada, and thus enables both inventors and the public to see exactly what is patented. There is an increase over the preceding year in the revenue from this source of $354.66.

The custom still prevails in furnishing this official publication to foreign patent offices in exchange for their reports; and it is also sent, without charge, to a large number of free libraries in Canada and in foreign countries, with the object of diffusing in the public interest the information therein contained. The publication is also furnished at the rate of 20 cents per monthly number or $2 per annum, and back numbers in print are furnished at the same price.

Patentees under the instalment plan, who have paid fees for one or more partial terms of their patents, not infrequently postpone payment of the further fees required to keep their patents in force until after the date within which they are payable; consequently the patents expire, and it is not in the power of the office to revive them. A revival can only be secured by a private act of parliament, the obtaining of which entails considerable expense to the patentee. The attention of patentees and their solicitors is again called to the necessity of their making these payments in time.

SESSIONAL PAPER No. 15

IV.—COPYRIGHTS, TRADE MARKS, INDUSTRIAL DESIGNS AND TIMBER MARKS.

Month.	Trade Marks.	Copyrights.	Designs.	Timber Marks.	Assignments.	Copies.	Total.
1899.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
November..	1,205 55	108 00	20 00	6 00	9 00	2 50	1,351 05
December..... ...	1,505 25	118 00	45 00	6 50	23 00	9 00	1,706 75
1900.							
January.....	945 25	98 15	39 00	2 00	48 00	8 50	1,140 90
February	915 00	81 50	49 00	6 00	20 00	3 50	1,075 00
March	1,000 00	101 50	85 00	6 00	15 00	20 00	1,227 50
April...	892 25	91 00	48 00	. . . ..	11 00	12 60	1,054 85
May	985 00	108 50	80 00	8 00	11 00	16 00	1,208 50
June	1,065 00	120 50	83 00	.... .	35 00	9 00	1,312 50
July	845 00	64 50	49 00	... .	11 00	12 60	982 10
August.....	906 75	65 50	56 00	6 00	21 00	11 00	1,066 25
September..	1,054 13	74 50	28 00	8 00	10 50	6 00	1,181 13
October.....	1,296 00	80 00	54 00	9 00	26 00	11 00	1,476 00
	12,615 18	1,111 65	636 00	57 50	240 50	121 70	14,782 53

The following table shows a comparative statement of the business of this Division from 1887 to October 31, 1900, inclusive:—

Years.	Letters Received.	Letters Sent.	Copyrights Registered.	Certificates of Copyrights.	Trade Marks Registered.	Certificates of Trade Marks.	Industrial Designs Registered.	Certificates of Industrial Designs.	Timber Marks Registered.	Certificates of Timber Marks.	Assignments Registered.	Fees Received.
												$ cts.
1887	1,543	1,543	554	167	245	245	105	105	16	16	56	8,192 53
1888..	1,655	1,889	566	167	285	288	71	71	29	29	71	9,262 86
1889...	1,721	1,987	616	178	280	280	88	88	26	26	49	9,111 88
1890..... .	1 766	2,169	685	222	293	293	68	68	21	21	104	9,876 38
1891.....	1,651	2,385	541	174	307	307	129	129	11	11	51	9,236 96
1892	1,773	2,300	556	159	294	294	30	30	27	27	66	9,496 29
1893.....	1,432	2,070	475	126	257	257	41	41	19	19	55	8,013 33
1894...	1,882	2,720	546	216	311	311	39	39	20	20	77	9,463 63
1895.....	2,184	3,279	601	163	374	374	52	52	20	20	70	11,673 26
1896.....	2,185	3,437	653	212	331	331	68	68	14	14	161	10,579 54
1897..... ..	2,606	3,548	756	273	446	446	75	75	13	13	94	14,101 93
1898	2,576	3,453	734	275	423	423	136	136	15	15	111	13,535 17
1899.. . ..	2,487	2,910	702	237	430	430	112	112	5	5	117	14,161 28
1900	2,679	3,213	893	247	447	447	126	126	22	22	126	14,782 53

The total number of registrations of copyrights, trade marks, industrial designs and timber marks, including registrations of assignments, was 1,624 during the year ended October 31, 1900. This consisted of 839 registrations of copyrights, 447 registrations of trade marks, 126 of industrial designs and 22 of timber marks. There were also issued 235 certificates of copyrights, 55 registrations of interim copyrights, and 12 certificates, 27 registrations of temporary copyrights, and 10 certificates. The total number of assignments of these different rights recorded was 136.

The correspondence of this branch of the department amounted to 2,679 letters received ; 3,213 letters sent.

The amount of fees received during the year, as certified by the accountant, amounted to $14,782.53.

V.—QUARANTINE AND PUBLIC HEALTH.

The year has been marked by the ever increasing threatening of the bubonic plague, both from the Orient to the Pacific side, and from Europe, South America, &c., on the Atlantic side. This threatening and the recent outbreak of this disease in Glasgow have led to my adoption of stringent precautions to prevent its ingress to this country.

Smallpox has come to maritime quarantines on both coasts during the year. It has prevailed to such an extent in the neighbouring states that I have felt constrained to establish a protective inland quarantine service on some of the international frontiers of the Yukon Territory, and of the provinces of British Columbia, Manitoba and Ontario ; and to suspend for the present my exemption of quarantine inspection of vessels from San Francisco and ports north of it.

Early last spring I sent Dr. Charles Higgins, bacteriologist, to the William Head Quarantine Station, at Victoria, B.C., to give the superintendent there his expert assistance in diagnosing, &c., any cases of plague or suspected plague that might present themselves.

Full details concerning the year's work at the different stataions, and at the Tracadie Lazaretto, will be found in the reports of my officers, annexed as appendices.

TRACADIE LAZARETTO.

The Inspector of Leprosy and Physician at the Tracadie Lazaretto (Dr. A. C. Smith) reports (see appendix No. 11) that there are twenty (20) inmates in the Lazaretto, being one less than the number reported the previous year, thirteen (13) of whom are males and seven (7) females.

There were four (4) deaths during the past year, and three (3) new cases were admitted during the same period.

The different stages of the disease at the present time is reported as follows :—

1st stage	7
2nd "	12
3rd "	1
	20

In the report of the Director General of Public Health (see appendix No. 1) will be found his remarks on leprosy.

VI.—STATISTICS.

The Statistical Division of the Department of Agriculture is based upon the Union Act, which specifically assigns census and statistics to the exclusive authority of the Parliament of Canada.

In accordance with this assignment of duties, the Parliament of Canada passed chap. 21, Acts of 42 Victoria.

In the Revised Statutes of Canada, 1886, this Act forms chapters 58 and 59. Chap. 60 is the authority for the collection of criminal statistics.

As misapprehension seems to exist leading to indiscriminate and unofficial publication of statistics, sections of the Act, chap. 59, R.S.C., are here given :—

The first section provides for the collecting, abstracting, tabulating and publishing of vital, agricultural, commercial, criminal and other statistics by the Department of Agriculture.

The fourth section gives the Minister of Agriculture power to arrange with any Lieutenant-Governor in Council, or with any provincial organization, for the collection and transmission of information collected under provincial systems.

The fifth section says :—

'The Minister of Agriculture may, in collecting statistics in the manner provided by this Act, call upon any and all public officers to furnish copies of papers and documents and such information as lie respectively in the power of such officers to furnish, with or without compensation for so doing, as is regulated, from time to time, by the Governor in Council.'

The sixth section provides for the publication of an abstract and record of the various departmental or other public reports and documents.

The seventh section gives power to the Governor in Council to authorize the Minister of Agriculture to cause special statistical investigations as regards subjects, localities or otherwise to be made.

The eighth section empowers the Minister of Agriculture to cause all statistical information obtained to be examined, and any omissions, defects or inaccuracies discernible therein to be supplemented and corrected as far as possible.

The ninth section is as follows :—

'Every one who wilfully gives false information or practices any deception in furnishing information provided for by this Act shall on summary conviction before two justices of the peace, be liable to a penalty not exceeding one hundred dollars.'

By another section in the Act, the Governor in Council is empowered to appoint temporary clerks or employees for an indefinite period.

The evident aim and intention of these several Acts is the establishment of a Bureau of Statistics which shall form part of the Department of Agriculture, and in which shall be consolidated the general statistics of the country, the officers in charge of which shall have every facility necessary to enable them to obtain the needed statistics from the several departments of the Federal Government, of the Provincial Governments, or by special statistical investigations.

A general collection and issue of Dominion Government statistics by the Statistical Division, as directed by the statute, would establish uniformity, coupled with increased accuracy and large economy in compilation.

The public appear to appreciate the efforts of this division of the Department of Agriculture, the preparation of general statistics in answer to inquirers having been greatly in excess of former years ; the aim is to give all inquirers the best information obtainable. The statistician's office has become a general inquiry office for all parts of the world.

In the course of these inquiries the statistician has been forced to confess the fact that Canada lags behind other countries in many branches of statistics.

In no branch have there been so many inquiries as to that relating to agricultural statistics. These inquiries have necessarily been answered in a most unsatisfactory way, owing to the absence of any system of collecting agricultural statistics co-extensive with the Dominion. If a good plan, ensuring accuracy and early publication, could be adopted in Canada, the value to farmers and business men of this information can hardly be over-estimated.

HEALTH STATISTICS.

No steps have been taken as yet to provide a better system of collecting vital statistics than that which was abolished in 1891.

In the provinces of Ontario, Quebec, New Brunswick, British Columbia, Manitoba and the North-west Territories, the provincial and territorial authorities have placed on the statute-books Acts dealing with the collecting of vital statistics. Section 4 of chap. 59 Revised Statutes, already quoted, gives the necessary legislative authority to enable my department to join the provincial authorities in making arrangements for the better collection of different kinds of statistics, without limiting the power of my department to enter upon provincial fields not worked by provincial organizations. By a combination of forces the result would be more satisfactory than by any other system that could be originated by the federal authorities. Instead of clashing statistics there would be statistics having a joint approval.

This plan could be carried out in respect to agricultural statistics ; so that while each province could have its own statistics for publication, the world at large would have those of the Dominion. The very great attention given to crop statistics in the United Kingdom, United States, France, Germany and Australia, and the large monetary operations based upon them, make it almost imperative upon Canada to provide her farmers and business men with these aids to successful efforts.

CRIMINAL STATISTICS.

During the twenty-four years, 1876-99, the functionaries of the courts or tribunals for the administration of justice in Canada have been called on to supply the Department of Agriculture and Statistics with returns giving certain particulars respecting crime, in accordance with the requirements of the statute chap. 13, Acts of 1876, as modified by chap. 60, Revised Statutes of Canada, 1886.

The classification adopted is the general one of indictable offences and summary convictions. The indictable offences are tried either by jury or (with consent) by police or other magistrate, and under the Speedy Trials Act.

The statistics of the earlier years are not complete, since the work was new to the officials. The country has, however, a body of statistics, fairly accurate, relating to crime for the period 1883-99.

This, though limited compared with the long-collected statistics of crime in many other countries, possesses value in enabling us to determine the position of Canada in respect to crime.

Taking, however, the period 1887-99 for our guidance through the labyrinths of criminality, we have for the thirteen years 484,260 convictions for indictable and other offences.

These totals show an average of 37,250 convictions for offences of all kinds. In the year 1899 the convictions were 38,710. Both absolutely and relatively to population punished crime in 1899 was higher than in 1898, as in 1898 it was higher than in 1897.

Of the 484,268 convictions, 60,981 were for indictable offences, the charges numbering 88,523, so that convictions formed 68·9 per cent of the charges. This approximates closely to the ratio in the two countries from which the great bulk of our population springs.

In the first three years of the period under review the charges made of crime and misdemeanours committed in connection with indictable offences averaged 5,659 a year. In the last three years they averaged 8,113, showing an increase in charges of indictable offences of 43 per cent.

The convictions consequent on those charges averaged 3,745 and 5,740 respectively, an increase of 53 per cent. Convictions, therefore, increased at a greater rate than charges, showing either more care in preferring the charges or stricter administration of the laws, or, more than probable, both greater caution in making charges and stricter administration.

Males convicted of indictable offences averaged in the first three years 3,416, and 5,392 in the last three years of the thirteen-year period, while females averaged 328 in the first, and 347 in the last, term of three years.

The proportion of the sexes in the first three-year period was 91 males and 9 females. In the last three-year period it was 94 to 6. The proportion of women criminals in the greater crimes is smaller, and may be said to have become fixed at the figure of 6 in the 100 criminals, with a slight tendency to a reduction of the rate.

The number of persons convicted for the first time in the first three years of the thirteen-year period averaged 3,210, and in the last three years 4,520. Relatively these criminals were 86 per cent of the total convictions in the first three years, and 84 per cent in the last three years.

Recidivists have increased, those convicted frequently forming nearly 10 per cent of the convicted in the last three years against 4·41 per cent in the period 1887-89, and those convicted twice forming 11·3 per cent against 5·3.

The increase is largely in the mining provinces of the Dominion.

According to occupations, the statistics warrant the following conclusions :—

1st. That compared with their numbers the agricultural class contribute a very small percentage to the criminal class.

2nd. That the commercial class commit, more than their proportionate numbers in the body politic warrant, crimes under the head of offences against the person, forgery and offences against the currency.

3rd. That the domestic class commit crimes just about in proportion to their numbers.

4th. That the industrial class have less than their proportion in all the six divisions of crime except in offences against property with violence, where they slightly exceed their proper proportion.

5th. That the professional class provide a much lower percentage of criminals than their proportionate share in the occupations would give.

6th. That labourers contribute more than their share to every class of crime, their percentage being : Crime 39 per cent, population 12 per cent.

About 60 per cent of the convicted were born in Canada. As the Canadian born population is 86½ per cent of the whole population, the criminals in the Dominion born outside of Canada are more numerous relatively than the Canadian born, forming but 13½ per cent of the population and supplying 40 per cent of the criminals.

Those unable to read and write formed about 13·8 per cent of the convicted in the 1897-9 period, against 14·9 per cent in the 1887-9 period. Those possessed of an elementary education were 74·5 per cent of the whole in 1897-9, against 76·6 per cent in 1887-9 period. Those having a superior education formed in both periods somewhat over 1 per cent of the convicted.

Cities and towns furnish 76 per cent of the criminal class of Canada, and the urban population is about 30 per cent of the whole population.

The total number of persons charged with murder during the thirteen years under review was 304, and the convictions numbered 99. The acquittals were 67·4 per cent of the charges. In the United Kingdom, France, Germany, Hungary, Italy, Spain and Belgium, taken together, the acquittals are 64 per cent of the charges in the case of the crime of murder. Canada approximates closely to the standard of these European countries.

There has been a decrease in the number of arrests and convictions for drunkenness; the annual average of the three years, 1887-9 being 12,821, and that of the

three years 1897-9 being 10,980, while convictions for infractions of liquor license Acts fell from an annual average of 3,700 in the first period to an average of 2,120 in the last period.

During the period 1894-99 the convictions for drunkenness and for infractions of liquor laws have been separated according to sex of offender.

For infractions of laws relating to liquor there have been in the period named 1,678 convictions of women, and for drunkenness 6,530. This is a yearly average of 280 for the first class of offences and 1,088 for drunkenness. The number of cases in 1889 was 303 for breaking the laws relating to liquor selling and 1,043 for drunkenness.

The proportion of women to men in 1894 was 102 in every thousand convicted of drunkenness, and in 1899 it was 94 in every thousand convicted.

The proportion of women to men convicted for breaking the laws relating to the sale of liquor in 1894 was 126 in the 1,000, and in 1899 it was 146 in the thousand.

There seems an opening here for women to exert their influence upon women to prevent the extension of woman's aid and co-operation in infractions of laws designed to curtail the distribuiton of intoxicating liquors.

The returns of 1899 are instructive, inasmuch as they show a danger to the State from the increase of juvenile crime.

One-third of all the convictions for indictable offences in Canada in 1899 was of persons under 21 years of age, and nearly one-half of this third were convictions of persons under 16 years of age.

The increase in 1899 over the average of a fifteen-year period is :

Criminals under 21 years.....	476
" " 16 "	289

This leaves the increase of criminals between 16 and 21 years to be 187 against an increase of 289 in the number of criminals under 16 years of age.

Thus the increase in juvenile criminals is much greater among those under 16 years than among those between 16 and 21 years.

There were 5,713 convictions for indictable offences in 1899. Of these 1,917 were of persons under 21 years, and of these 1,917 no less than 936 were under 16 years.

During 15 years the total number of convictions for indictable offences was 68,287. Of these 20,606 were of persons under 21 years, and divided into 11,911 between 16 and 21 years, and 9,705 under 16 years.

In the whole period juvenile criminals were 30·2 per cent of the total number ; in 1899 they were 33·3 per cent. In the first year of the series (1885) they were 29·3 per cent, thus showing a gradual but steady increase.

Taking the 936 juvenile criminals under 16 years, they are divided for 1899 into :

	Males.	Females.
Juveniles committing offences against the person.....	42	—
" " " " property with violence.....	87	—
Juveniles committing offences against property without violence.....	740	37
Juveniles committing malicious offences against property.....	19	—
Juveniles committing forgery and other offences against currency....	8	—
Juveniles committing all other indictable offences.....	3	—
Total....	899	37

The overwhelming proportion of juvenile crime is in the three classes which include offences against property, and the very great proportion is in that particular class denominated 'offences against property without violence,' these numbering 777.

Analysis shows that of these 777 cases, 768 come under the head of larceny—picking up things that belong to some one else and appropriating them.

The table above given shows the distribution of the remaining 159 cases.

THE STATISTICAL YEAR-BOOK.

The work is published by my department under authority of chap. 59, sec. 6, Revised Statutes of Canada.

The demand for the work increases every year. Requests for the 1899 edition from the governments, public libraries and chambers of commerce of France, Germany, the United States, Italy, Japan and other foreign countries have been received, while the number required for the United Kingdom and other portions of the British Empire has been larger than ever.

An increasing number of lengthy notices, abstracts and resumes of the Year-Book is noticeable in the newspapers of Great Britain, France, Germany, Japan and other countries.

The demand within Canada continues to increase every year.

There is a great demand for back numbers to make up full sets. As a result, the edition of 1893, '94, '95, '96 and 1898 in English are completely exhausted.

The Year-Book in French has been increasingly in demand. Of the earlier years there is a good number in stock. Of later years, 1891-98, there remain very few copies, and of 1891, '93, '94 and 1895 none at all.

The demand of late years for the French version is the most satisfactory fact in the history of the Year-Book.

During the year the letters, circulars and statements sent from the office numbered 7,550, and those received 8,391.

The whole respectfully submitted.

SYDNEY A. FISHER,
Minister of Agriculture.

APPENDICES

QUARANTINE AND PUBLIC HEALTH.

No. 1.

REPORT OF THE DIRECTOR-GENERAL OF PUBLIC HEALTH.

(F. Montizambert, M.D. Edin., F.R.C.S., D.C.L.)

October 31, 1900.

Sir,—I have the honour to submit herewith my annual report as Director-General of Public Health, to October 31, 1900.

The year has been marked by the continued threatenings of bubonic plague, and its actual outbreak in several new quarters. Smallpox also threatened us on both coasts and along the inland frontiers to even a greater degree than is customary.

Bubonic Plague.—The outbreak in Santos in October, 1899, referred to in my last annual report, was followed by the occurrence of the disease at several other ports in Brazil, including Rio de Janeiro, and in the Argentine Republic. Most of the important seaports of Australia have been infected since the beginning of this year, when cases occurred first at Adelaide. It is probable, owing to the numbers of Chinese, that the infection there has usually arrived from China. Sydney has had 303 cases, with 183 deaths. On September 30 last a case occurred at Charters Towers, a great mining centre, the first inland Australian town to be visited by the disease.

The epidemic in Oporto and other parts of Spain continued during the winter; the port of Oporto was not declared to be free from the disease until the month of February. At Lisbon, a medical man, Dr. Camara Pestana, was amongst the victims. A London correspondent of the London *Times* sends some pathetic details of his death: 'It seems that Dr. Pestana actually caught the plague through his anxiety to learn all that he could about it. He was dissecting the body of a patient who had died from plague, and in order to extract the virus more thoroughly he put aside his instruments and worked with his fingers. The poison entered his system under the fingernails, and he was struck down with the terrible disease which he was investigating. He was at once moved to an isolated ward set apart for plague sufferers, and there he set himself to study his own case and to record for the benefit of humanity his own symptoms, and the course of the disease. He refused to see his brother for fear of infection, and in every way, even in making arrangements for his own funeral, he took every precaution to prevent the spread of the plague. His mind and will conquered his bodily sufferings until the very end, and even as he died he was still trying to indicate to those around him the lessons of his own case. He left a letter for the Queen of Portugal, begging for her influence in favour of his colleagues at the Lisbon Bacteriological Institute. So died the heroic doctor, who "had toiled for months amid the horrors of the plague hospital and dissecting-room, and at last gave his life a willing sacrifice for the benefit of the whole world."'

In China, plague has been present, as always. In Hong-Kong alone, the reported cases, from January 1 to September 1, numbered 1,063 with 996 deaths.

In Japan it has been present, principally in Osaka and Kobé: it still prevails in Kobé.

It has occurred in the Philippines, with 215 reported cases in Manila and 146 deaths.

It has prevailed in India throughout the year. During the last week of September and the first week of October the number of deaths from plague in India were 2,136 and 2,123 respectively; there was thus a slight decline. This is a hopeful sign, as during every autumn since 1896 the number of deaths from plague has increased progressively week by week until the present year. It is unwise to build upon so slight a decrease, and to prophesy a cessation, but in the northern parts, at all events the lessening of the severity of the famine may have something to do with the relative falling off of plague cases.

In Bombay the number of plague deaths was 87 and 86 respectively for the last week of September and the first week of October. These returns show that the mortality from plague this year is but half of that recorded during the corresponding dates of the past four years. Mandvie, the district of Bombay where plague first appeared, and where during every recrudescence it has been most virulent, accounts for 21 out of the total of 87 deaths recorded in Bombay. In every other district an improvement is evident, and it is surely time that the sanitary authorities in Bombay seriously tackled this insanitary district, completely evacuating the whole of it, if need be. This may appear an expensive and a high-handed measure, but if it would rid Bombay of plague, it would be repaid a hundredfold in the near future.

In the Bombay presidency, during the week ending October 7, there were 1,142 deaths from plague; the majority of the deaths occurred in the cities of Poona and Belgaum. In Poona the numbers vary from day to day, but between 70 and 104 deaths were recorded daily during the week. Many of the shops in Poona are closed, and the well-to-do residents are once more leaving the city. The authorities are closely watching the effects of inoculation in the community. Fifty-two persons inoculated more than a year ago have had the disease, but only in a mild form. In the Poona cantonment no case of plague had occurred amongst those inoculated last year. Among 7,688 persons inoculated this year no cases have occurred up to the present.

In Belgaum the disease continues unabated, some 20 to 30 deaths from plague occurring daily. Three Europeans (two soldiers and one civilian) attacked by plague are all recovering.

In Mysore City the alarming increase previously reported continues. Abandoned corpses, dead of plague, are being found in several districts of the city, proving how severe is the epidemic. During the three weeks previous to October 7, the plague deaths in the city of Mysore numbered 480, 609, and 543 respectively.

In Bangalore the mortality from plague, during the three weeks previous to October 7, was 65, 95, and 91 respectively. Where places have been found newly infected, dead rats have been met with in numbers.

A great outbreak of plague is reported from the Kolar gold fields.

In Calcutta the plague deaths during the two weeks previous to October 7 were 47 and 88 respectively.

It has appeared in the Hawaiian Islands; Australia; in Aden, Port Said and Alexandria; in Cape Town; Mauritius; in Brazil, in Paraguay, and the Argentine.

Vessels with plague cases on board were brought into several English ports, and to San Francisco, New York, and Port Townsend.

Bubonic plague was brought into New York harbour, November 18, on the steamship *J. W. Taylor*. The ship left Santos, Brazil, October 24, sailing directly to New York. Robert Hope, the steward, had been in a hospital in Santos for a fortnight, suffering with what was supposed to be eczema. He returned to his ship when it was ready to sail, and was able to attend to his duties. After being on board for a week he was compelled to go to bed, and died in a few days. No physician was on board, but from the symptoms, which were carefully recorded, there is no doubt that his death was the result of the plague. The disease had been present in Santos for several weeks, and there is nothing strange about Hope having taken it. The day he died,

the captain and the cook, both of whom had been taking care of the deceased steward, were taken down with the premonitory symptoms of the disease. On arriving in New York, the two sick ones were sent to Swinburne Island. Every possible care was taken to prevent the possibility of the extension of the disease.

It was brought to the quarantine at Port Townsend, on the Strait of San Juan de Fuca, opposite William Head, on January 30, by the Japanese steamship *Nanyo Maru*. There was one death at quarantine from the plague.

It has just been brought to the port of Bremen on the steamship *Marienburg*, from Buenos Ayres.

In Glasgow, the recent cases of plague amounted in all to 28 definitely reported since the end of August. There have been eight severe cases, and of these all eight died. The source of infection was not clear, but the tendency is to connect it with the shipping. The cases occurred, however, at a distance of over two miles from the docks. There were also four cases of plague or suspected plague in Govan. Surgeon-General Wyman received a report from Assistant Surgeon Thomas, of the Marine Hospital Service, in charge of the plague inspection work at Glasgow, detailing the history of the outbreak. The report states that all the cases are to be traced to a wake held over a woman who died about August 21. She lived in a crowded tenement quarter, some distance from the shipping, and no connection can be traced between her sickness and any infected ship, except that her husband was at work on the docks. The disease in the early cases was of the pneumonic form, and the death of this woman was certified as pneumonia, and there were a number of other cases of supposed pneumonia among those who had attended the wake or had been thrown into contact with the woman. On August 25 a child died, and on the 27th his mother and two brothers were taken to the hospital. One of the brothers died, and his death was certified as bubonic plague. Cultures of the plague bacillus were made from his organs, but the inoculation experiments are not yet complete. As soon as a suspicion of plague arose, all persons known to have been in contact with the cases mentioned were removed to new quarters, were bathed, and their clothing was disinfected. A few cases have been sent to the hospital from this contingent. All the cases in the hospital at the time of Dr. Thomas's report were of the bubonic form. Careful inquiry does not show that there has been any unusual mortality among the rats in Glasgow, but war has nevertheless been declared against them, and rat-catchers are busy capturing and killing them.

The most satisfactory theory of the origin of the outbreak is that the source was an unrecognized ambulant case which occurred in some sailor or traveller. As in other diseases, while plague is extremely easy of recognition in well-marked typical cases, it is not so in its slighter and atypical forms.

On the 4th of this month a death from bubonic plague occurred in Cardiff, Wales. W. Garnett, aged thirty-eight, donkey man on board the ss. *South Garth*, left Rosario (La Platte) about August 20. The vessel called at Buenos Ayres and shipped, in place of an old hand who deserted, a new one—an Austrian—who acted as third engineer. When the vessel arrived at the Tyne, on September 21, this man, who was seriously ill from 'enteric fever,' was sent ashore to a hospital. Two days subsequently Garnett left the boat at South Shields in consequence of not feeling well. He travelled from there to his home in Cardiff, reaching his destination on September 27. He was medically attended from September 28 to October 2, when, suspicious symptoms developing, he was transferred to the Cardiff Isolation Hospital as a possible case of plague. He died on October 4. The clinical diagnosis of bubonic plague was confirmed by the bacteriological examination. The body was at once removed to an island in the Bristol Channel and cremated.

There can now be no doubt that Chinatown, San Francisco, has been infected with the bubonic plague since the early part of this year at least, although the number of cases reported is small. Between March 8 and June 2, ten fatal cases of this disease occurred in San Francisco amongst the Chinese. On May 19 the local board of health officially announced the existence of plague in San Francisco. Another case was

found on June 14, others during July, and this month three cases have been reported, one on October 5, one on October 10, and one on October 14, all confirmed by bacteriological examination; a total of nineteen cases reported, with seventeen deaths. How many more have died of the disease, how many corpses or bones of such persons have been shipped from, or are now waiting shipment to China in, the underground hiding-places of Chinatown, San Francisco, probably no white man knows or ever will know. Dr. Kellogg, the city bacteriologist of San Francisco, under date of May 19 last, wrote as follows:—'Just how the disease was introduced into this country is a mystery, as the first case discovered was in a Chinaman who had been in Chinatown sixteen years. The probability is that he was not the first, and this theory is strengthened by the fact that there had been an increased mortality in that district during the months of January and February. During those months there were 97 deaths reported from the Mongolian quarter, and of these 20 were ascribed to lobar pneumonia, 5 to bronchopneumonia, 4 to typhoid fever, and 7 to acute miliary tuberculosis. Now all of these diseases, in the beginning of an epidemic of plague, should be regarded with suspicion, and examined bacteriologically, for they are simulated very closely by the pest.

'The assistant city physician, whose duty it is to inspect all dead Chinese who have died without attendance by a regular physician, is at a great disadvantage in arriving at the cause of death. He simply sees the body after death, and by questioning the relatives or undertaker, who are ignorant and use very broken English, he makes a guess at the cause of death, taking into account the appearance of the body. According to the Caucasian statistics of San Francisco, the number of deaths from pneumonia, typhoid, and miliary tuberculosis, to every 97 deaths, would be 12·3, whereas the assistant city physician, with the means at his command, has been forced to consider that there were 36 of these cases out of a total of 97 deaths for the two months. Since the plague can readily be mistaken for these diseases, we are justified in the suspicion that some of these cases were plague. Nor is the fact that we have not now a widespread epidemic proof to the contrary, for it has been the history in other parts of the world that the plague gets a foothold very slowly and insidiously. There is a first case, and then it may be a couple of weeks before the second, and they may appear occasionally and at intervals of several days or weeks, until the houses and the quarter become infected, and then the real epidemic breaks out, and hundreds of cases occur.'

The following report of the last three cases of bubonic plague in San Francisco this month is given in the Journal of the American Medical Association :

Case 16.—Lea Do Hen, aged 50, Mongolian, cigarmaker, had lived in California 28 years. His residence was 710½ Dupont street. Patient died Oct. 5, at 10 p. m.

Examination of the body revealed a large bubo in the right inguino-femoral region. Incision disclosed a lymph node about the size of an egg, surrounding which the tissues were filled with a chocolate-coloured fluid. The cut surface of the gland was very dark, purple and mottled, but substance fairly firm. A microscopical examination showed numerous bipolar-staining bacilli, decolorizing by Gram's method. Two guinea-pigs were inoculated with a glandular emulsion on Oct. 7.

One of the pigs lived four and one-half days after inoculation. On examination there was found a large area of coagulation necrosis surrounding the point of inoculation on the anterior abdominal wall. There was widespread edema and hemorrhages into the subcutaneum. The lymph nodes were enormously enlarged in both groins, the mass on each side being about the size of a lima bean. Both lungs were studded with yellowish-white nodules. Each pleural cavity contained about 2 c.c. of pinkish mucilaginous fluid. The liver was greatly enlarged, congested and mottled. Spleen was about fifteen times its normal size, dark and friable, and covered with yellowish specks. The vessels of the mesentery were injected. There was a small amount of pinkish fluid in the peritoneum. The suprarenal capsules and pelves of both kidneys were hemorrhagic. The organs of the animal contained the plague bacillus in great numbers, and it has been obtained in pure cultures from them.

Case 17.—Chun Yen, male, aged 37, Mongolian labourer, had been in California 10 years. Residence was 767 Clay street. Patient died Oct. 10, at 2 a.m. According to the statement of a white physician who lives and practises among the Chinese, he was sick two weeks and died of typhoid pneumonia. The body was that of a very large, fat and well-nourished man, who would probably weigh 200 pounds. An enlargement of the glands of the left femoral region could be detected through the thick layer of fat. These were removed and found to be about the size of hazel-nuts, very dark and necrosed. Smears showed the typical bipolar bacilli in large numbers. Two guinea-pigs were inoculated on October 11, with an emulsion of the glandular tissue, and both lived about three and one-half days.

Autopsy: Guinea-pig No. 1. Large areas of coagulation necrosis surrounding the point of inoculation; marked subcutaneous edema; enlargement of the lymph nodes and hemorrhages in the left groin and axilla; lungs normal; spleen about three times normal size; very dark and soft, but no yellow spots; punctiform hemorrhages in peritoneum covering small intestines.

Guinea-pig No. 2. Large area of coagulation necrosis at the point of inoculation, surrounded by a zone of edema and subcutaneous hemorrhage; a marked hemorrhage in the left groin, but no enlargement of the glands; lungs normal; spleen about three times normal size and shows a few yellow spots; same condition of peritoneum as in first pig.

The plague bacillus was recovered in pure culture from both pigs. It is worthy of note that Chun Yen contracted the disease in the same house as the thirteenth case, that of Lee Wing Tong. This house was quarantined and thoroughly fumigated in the interval between the two cases.

Case 18.—Tai Dong Leong, male, aged 39 years, Mongolian, had lived 25 years in California. Residence was 905 Clay street. Patient died October 14, at 11 p.m.

The diagnosis of this case was established by a clinical examination of the blood during the life of the patient, who was attended by a reputable white physician, who reported the case to the health department as suspicious, as soon as he had seen it.

On October 14, the patient was seen by a number of physicians, among them were Drs. Ryfkogel and Kinyoun, and blood, as well as some fluid from the bubo, were secured for examination. These samples both showed the specific bacillus in large numbers, and it was also secured in pure culture from both sources.

Two guinea-pigs were inoculated, one with the pure culture grown from the blood, and the other with spleen obtained at the autopsy.

The guinea-pig inoculated with the pure culture died in four days of a typical plague infection, there being the usual coagulation necrosis at the site of inoculation; a moderate amount of subcutaneous edema; and an enlarged spleen; the latter however, in this instance, containing much larger numbers of the plague bacillus than usual.

The following letter concerning this outbreak in San Francisco has just been addressed to Surgeon General Wyman:

'SAN FRANCISCO QUARANTINE STATION,

'ANGEL ISLAND, CAL., October 29, 1900.

'SIR,—In reply to Bureau letter of the 20th instant (C. H. W.,) and in confirmation of telegram sent on the 27th, I have the honour to state that during the month of October three cases of plague have occurred in San Francisco among the Chinese. All cases terminated fatally. The first death occurred on October 5, at 720½ Dupont street. The case was a cigarmaker, who had been working just previous to his last illness in a cigar factory on Battery street. The history which was obtained from the acquaintances of the man was that he had been ill about four or five days before death. No clinical history of his illness could be obtained. The post-mortem examination was limited to the removal of the enlarged femoral glands, which, on examination,

both microscopically and bacteriologically, showed the plague bacillus. The bacteriologist of the city board of health submitted some of the gland tissues to me for an examination. This was examined in the laboratory at this station, with the result of confirming the diagnosis.

'The second death occurred on October 10 at 767 Clay street, in the same house whence a case of plague was removed to the city hospital, dying there on July 5. This man had been ill for a week or more, and was treated by a white physician. The death certificate gave the cause of death "typhoid pneumonia." Dr. Kellogg informs me that on inspecting the body a mass of enlarged femoral glands was seen, which, on removal, showed evidences of acute infection. Microscopical and bacteriological examination demonstrated the cause of death to be plague.

'On October 14, at request of Dr. O'Brien, the health officer, I visited a case at 905 Clay street, which was reported to present certain suspicious symptoms. This case gave a history of being ill for three and one-half days. The attack commenced with a rigor, followed by fever, giddiness, nausea, and vomiting. He was seen on the evening of the 13th by a white physician, who stated that his temperature at the time of his visit was considerable over 38° C., pulse very rapid and weak. There was also nausea, vomiting, and slight diarrhœa. On the following morning—the 14th—a considerable swelling of the glands in the femoral regions was observed. There was considerable elevation of temperature, and more prostration than existed the day previous. He then reported the matter to the health officer as being probably a case of bubonic plague. The patient was seen about five o'clock on the same day by several physicians, viz.: Drs. Bulkley and O'Brien, of the health board; Dr. Bunnell, police surgeon; Dr. Ryfkogel, bacteriologist to the State board of health, Dr. Lumsden, Dr. Pillsbury, and myself. The patient presented the appearance of one profoundly ill with an acute infectious disease. His temperature was 39·7 C., pulse 140, soft and compressible. There was considerable delirium. Physical examination revealed an enlarged spleen and a mass of enlarged glands in the left femoral region. There were also several reddish spots over the chest and abdomen, having all the appearances of subcutaneous hemorrhages. Cover slip preparations were made from the blood, and also of the fluid aspirated from the gland. Cultivations were also made from the gland and blood. Microscopic examination of the cover slips demonstrated the presence of numerous diplo-bacilli, which morphologically resembled those of bubonic plague. These bacilli took on a bipolar stain with thionine, and were easily decolourized by Gram's method. The cover slips made from the fluid removed from the gland contained countless numbers of these bacilli. In fact, it appeared more like that of a pure culture of plague than a specimen taken from the body. The case died at eleven o'clock that night, and on the following day Dr. Kellogg, the bacteriologist, made a post-mortem examination, removing the spleen and mass of enlarged glands. These tissues on examination gave the typical appearances of plague infection.

'On the following day, the 16th, colonies had developed in the tubes inoculated from the blood and glands. These were examined and found to be those of bubonic plague. Animal inoculations made from these cultures were in every way confirmatory.

'The State board of health have instructed their bacteriologist, Dr. Ryfkogel, to be present at all post-mortem examinations and make an independent investigation. All sanitary inspectors, which were for a time employed by the various members of the board of health at the instance of the governor, have been discharged. Dr. Crowley, a member of the State board of health, stated to me on the 27th instant that the State board of health was of the opinion that for the time being the city board of health was able and ample to meet the requirements of the situation; that while there had been bacteriological evidence of the existence of bubonic plague, there was not sufficient clinical data to warrant any steps to be taken. * * *

'In conclusion, I would state that it is my belief that the area of infection is gradually growing wider, so that now there are only three blocks of the Chinese quarter proper in which there has not occurred, since March last, a case of plague. The

conditions which will obtain in the next six months will be, in my opinion, conducive to a further outbreak. The Chinese population will, in a few weeks, be augmented by several thousand more than exists during the summer months. About 3,000 Chinese return every fall from the salmon canneries of Alaska. Then, at the end of the fruit-picking season, which now is rapidly drawing to a close, large numbers of Chinese who are thus engaged seek a temporary home in San Francisco during the winter months. These people to all intents and purposes are contract labourers, and are of the lowest coolie class. They live under the worst hygienic conditions imaginable. It would, therefore, not surprise me to see a number of cases of plague occurring among this class of people. I will transmit, as soon as obtainable, a map showing the infected area, as well as the number of cases which have already occurred.

'Respectfully,

'J. J. KINYOUN,

'*Surgeon, U. S. M. H. S.*'

Haffkine's Fluid.—Drs. Christie and Neild Cook have recently published the results of their experiment with Haffkine's fluid in Calcutta in 1898. They inoculated some 2,490 patients between April and July, none of whom died of plague during that year's epidemic. The ordinary dose of Haffkine's prophylactic for an adult male was 5 c.c. ; for a woman, 4 c.c. ; for girls between the ages of ten and fourteen years, 3 c.c.; for children from two to ten years, from 1½ to 3 c.c. The writers selected the back and outer side of the arm midway between shoulder and elbow as the site of inoculation. The reaction in many cases began at once with pricking at this site, and the gradual formation of a hard, tender red swelling for a few inches round. The temperature rose within six hours. The height of the fever varied greatly, rarely lasting more than two days, though the arm remained more or less painful and tender for a week or ten days, and a small, hard nodule often remained for a few weeks. There were no untoward results.

Viability of the Plague Bacillus.—In a preliminary note issued in the Public Health Reports of the United States Marine Hospital Service, Dr. Rosenau places on record the results of some experiments upon the length of time for which the plague bacillus retains its vitality. The method employed consisted in keeping various materials infected with this bacillus under varying conditions of light, temperature, and moisture. The organism was obtained from five different sources—one from Jeddah, one from Oporto, one from Rio de Janeiro, one from Bombay, and the fifth from the New York quarantine case. The bacillus retained its vitality and virulence (for mice) for seventy-five days on small balls of absorbent cotton soaked in a few drops of a gelatine culture mixed with egg albumen, when these balls were kept in a dark room or cool incubator at about 20° C., and not exposed to the influence of other contaminating organisms, though desiccation was not materially retarded. On other material exposed to higher temperature (27° C. or over), vitality was lost in a period not exceeding a fortnight. The other materials infected were small squares of fabric, chips of pine wood, and pieces of paper. No experiments in which mixed infection played a part are recorded, so that natural conditions were apparently not reproduced. Appended to the account of these investigations is a summary of the results of other experimenters who have worked on the same lines, and it is evident from this that the plague bacillus cannot withstand desiccation at temperatures approaching 30° C. Dr. Rosenau has been more successful than any other investigator in keeping that organism alive for seventy-five days, but the conditions of the experiment were such that complete desiccation was not obtained. The practical bearing of experiments in which pure cultures are used, and in which mixed infection plays no part, is small, and bacteriologists and hygienists in general are still waiting for an exhaustive series of investigations into the viability of this bacillus under circum-

stances which shall more faithfully reproduce the environment and conditions of plague-infected material as met with in its endemic home.

A City Plague Laboratory.—The New York city board of health, at a recent meeting, awarded a contract for the building of the laboratory for the study of the bubonic plague on the Willard Parker Hospital grounds at the foot of East Sixteenth Street. The cost of the building will be $19,893. The laboratory is to be built in three months.

Dr. Yersin is of opinion that no conclusions can be drawn from the exceedingly mild type of the disease in the recent epidemic of plague in Oporto and in the outbreak in Glasgow as to the severity of possible future otbreaks in the British Isles or elsewhere in Europe. In the Far East it has often happened that one town has a mild form of plague, while a town not far distant presents a very grave type of the disease. With the plague we must be prepared for any type of the disease. It is quite possible, when in the course of the next few years the bacilli have become acclimatised in their new surroundings, that their virulence will increase, and that we shall see the same severe form of plague as visited Europe in the Middle Ages.

Precautionary Measures.—In my last annual report I mentioned the refusal just received from the Institut Pasteur, Paris, to my application with regard to a supply of anti-plague curative serum, Canada being a non-contaminated country. Since that time, however, this restriction has been removed, and there is now a sufficient supply of this serum available for issue at a day's notice to any station where it may be required. Haffkine's prophylactic fluid for inoculation as a preventive against plague has been issued to your quarantine stations, and a considerable stock of it is on hand for further distribution, should circumstances so require.

A supply of the Danysz rat virus (the *bacillus typhi murium*) has also been issued to your stations, and communications opened with the shipping ports, with a view to endeavour to destroy, or diminish in number, the rats which infest the piers and shipping warehouses. The cultures of this bacillus convey a fatal disease to rats, but do not affect other animals.

At intervals during the year letters of warning and direction were sent to your various quarantine officers as the increasing threatening of plague seemed to require. Full instructions were supplied them as to the most recently accepted practical and scientific measures to be adopted.

The shipping companies were communicated with, as well as the quarantine officers, with regard to the prevention of the landing in Canada of rats from vessels plague infected or from a plague infected port. The use of large funnels of galvanized iron to guard the hawsers between such vessels and the piers or lighters was enjoined, both to prevent the embarkation of rats at the port of departure and their debarkation at the port of arrival. In conjunction with this, the closing, as far as possible, of all means of ingress and egress at night, and the guarding of any left open was desired.

When plague was declared at Glasgow, vessels coming from there were required to produce a record, taken within twenty-four hours of arrival, of the temperatures of those on board for the information of the quarantine officer. This procedure, even where no surgeon is on board, is of use to the quarantine officer and presents the further advantage that it ensures the bringing of all on board before and under the observation of the surgeon or master shortly before arrival.

In March last, on the occurrence of the first reported case of plague in San Francisco, your ministerial order under section 9 of the quarantine regulations, excepting from those regulations vessels from San Francisco and north of it, was by you withdrawn. Since that date all vessels from San Francisco, from Puget Sound ports, and from Alaska have been inspected on arrival at British Columbian ports.

And further, in view of the existence of plague in San Francisco, orders were issued that any Chinese from there arriving at William Head should be landed there and held under observation to complete twelve days from date of departure, with bathing and disinfection, this to include Chinese by healthy vessels. This period of twelve days is the maximum period agreed to as permissible for observation for plague

by the International Sanitary Conference of Venice, as laid down in their convention signed there in 1897, and subsequently ratified at Rome.

Vessels from Glasgow arriving at Canadian ports since the outbreak of plague in that city have been held to complete the necessary period of observation at quarantine, where it has not been taken by the voyage. This period, as laid down in the above-mentioned convention, is not in ordinary circumstances to exceed ten days.

In June last, a request was received from the local health authorities in British Columbia to have all ships arriving from plague-infected ports fumigated with sulphur sufficiently to kill all rats and other vermin in said ships. This recommendation was, by your authority, replied to as follows:—

'To ensure destroying vermin requires simultaneous fumigation throughout vessel, and probably repeated. It involves landing all persons and at least partial shifting of cargo. The delay to all interests and possible injury of some cargoes renders routine sulphurizing of healthy vessels unjustifiable, and would practically close our ports. It is unknown elsewhere, and not proved essential by us since 1894. Funnels, guards, &c., already ordered at quarantine. Their use at Victoria and Vancouver comes under city health officers.'

With regard to the question of cargoes and importations of merchandise generally, it is a matter of international sanitary agreement that new merchandise need not be feared on account of its coming from an infected country, but may be accepted without question. Plague has been present in China for many years, and has been in Hong Kong since 1894. During those years hundreds of vessels have brought merchandise to our ports from the Orient. Thousands of vessels have arrived from various plague-infected countries at such ports as London, Liverpool, New York, &c., and yet not one single instance has occurred where infection can be shown to have been introduced by a cargo. With regard to importations from Chinatown, San Francisco, to the Chinatowns of Victoria, Vancouver, Westminster, Nanaimo, &c., I may say that but very little of this is carried on. Chinese merchants in British Columbia import directly from China. When they run short of anything such as nut oil, chow-chow, vermicelli, or soy, they may get a temporary supply from San Francisco, but it will be transhipped from there in bond and in the original parcel in which it left the Orient. The trade that formerly existed in cotton shirts, overalls and carpet slippers has now ceased, as these things are now all made in Victoria. Leather for shoes is occasionally purchased from San Francisco, but not often, and then from white merchants. Salt bean cakes, dried shrimps, and dried small fish are imported from California, but they are put up on the coast, far from San Francisco. Fruit and green vegetables grown in California are imported into British Columbia, and possibly some of it passes throgh the hands of the Chinese dealers in San Francisco. But if there be a risk in this, it is one that British Columbia shares with the remainder of this continent, wherever California fruit is brought into the market.

The practical evidence that no known spread of the disease has ever occurred attributable to classes of merchandise above referred to is being more and more corroborated by our increasing scientific knowledge of the life history of the micro-organism that gives rise to the disease.

The possibility of the spread of plague in Great Britain or the continent of Europe and in this country is a very pressing danger. That the mortality from the disease will be high or that any one locality will suffer severely is perhaps unlikely, but that cases will occur in our quarantines and at our seaports for the next few years must be regarded as probable. At no period since the Crusades have soldiers of so many nations flocked eastwards: never before have so many ships sailed for Asiatic ports, nor has communication between Asia and other countries been so intimate. As this has occurred at a time when plague may be said to be pandemic the danger of our infection is immediate. It is only by vigilance, constant and prolonged, that this, the most stealthy of infections, can be fought—a vigilance which must extend not merely for weeks or months, but for several years to come. The danger of plague

infection will continue whilst plague exists in Asia, or whilst it is prevalent in any centre in direct communication with the rest of the world, and with us by land or sea.

Its control at quarantine or at a seaport depends greatly upon its prompt recognition. In doubtful cases, and they are many, a bacteriological examination is essential for the diagnosis.

Rigid quarantine of infected or inspected persons and clothing, and a wholesale destruction of rats are measures of the first importance.

Of paramount importance, however, is the need that quarantine officers should be able to diagnose accurately cases of plague, by bacteriological examination. Recognizing this fact, Dr. Higgins, your bacteriologist at Outremont, was transferred early this spring to the William Head quarantine station, and a bacteriological laboratory was established there. At it, in addition to his other duties, a full supply of Haffkine's prevention plague fluid was prepared by this efficient officer. Provision was also made in the last estimates for the establishment of a bacteriological laboratory at Halifax.

Recommendation.—I would respectfuly submit for your consideration the desirability of requiring each of your quarantine officers to go through a qualifying course of bacteriology. The necessary leave of absence, and possibly the granting of a locum tenens, being matters I would urge upon your favourable consideration.

If Dr. Higgins is to continue his investigations at Outremont—as he is anxious to do—I would beg leave respectfully to recommend that a permanent medical assistant with full knowledge and experience of bacteriology be appointed to the William Head station. The inspection and other work there are greatly increased, and call for a medical assistant, and the threatening of plague which we must expect to lie under for some years to come as it closes in ever nearer and nearer to us, warns us in unmistakable terms that that medical assistant should have the technical knowledge and experience necessary to diagnose by prompt bacteriological examination even doubtful cases of this disease.

For similar reasons I beg leave to similarly recommend that the vacancy at the Grosse Isle Quarantine station now being caused by the resignation of the medical assistant there, be filled by the appointment of a bacteriologist to the office. That station has already its laboratory provided and equipped.

Small-pox.—This disease has threatened us throughout the year, on the Atlantic and Pacific coasts, and from the neighbouring republic across the frontier. It came to your organized quarantines at Grosse Isle and William Head, and has caused you to establish an inspection service in Prince Edward Island, and at the unorganized inland quarantines at frontier points of entry from the United States. The disease in the States has been of a very mild type, the so-called 'ambulatory' form. This causes little loss of life, but is much more difficult to limit or control than a more severe type would be. When small-pox is severe the patients are in bed, and can therefore be identified, reported and isolated. When it is mild and the patients walk about and travel, distributing it generously on all sides, the task of the health authorities is rendered much more difficult. With this type no certainty can be arrived at of preventing the crossing of the frontier by patients on foot or in vehicles, no matter how closely railway and steamboat international crossings and frontier trails may be watched. Moreover, of course, the period of incubation of small-pox is such that no absolute certainty of exclusion can be hoped for without a routine detention, under observation, at the frontier, of all incoming travellers. This would—needless to say—be a quite impracticable and unjustifiable interference with travel and traffic.

But, notwithstanding these possibilities of 'leakiness' in any land quarantine for this disease, much may be done at frontiers in straining out actual cases by inspection, and protecting by vaccination the unprotected who have been exposed, and thus doubly limiting the importation of fresh centres of infection into the midst of our people. Accordingly, a number of medical inspectors have been at work along our southern frontier, and also on that of Alaska.

Partly on account of small-pox in the United States generally, and partly on account of plague in San Francisco, on April 4 your ministerial order was suspended which excluded vessels from San Francisco and ports north of it from the quarantine regulations.

Small-pox was brought to the St. Lawrence quarantine by the ss. *Mont Blanc*, from Bordeaux. It was brought to William Head by the ss. *Monmouthshire* from the Orient, by the *Walla Walla* from San Francisco, and by the ss. *City of Seattle* from Skagway and Ketchikan in Alaska. The case of the ss. *Monmouthshire* was peculiar in that this vessel of the Northern Pacific Company was bound to Portland, Oregon, from the Orient, but, finding small-pox on board, her captain put in to William Head and asked for quarantine treatment there. The following extract from the Victoria *Times* will show the opinion he was led to form of your quarantine system:—

'The loss occasioned by the steamer *Monmouthshire* because of the illness of one of her Chinese passengers is estimated at $10,000, taking in customs, dockage, harbour, pilotage and other port dues, feeding and transporting the delayed Asiatics, time lost, cargo damaged, &c. There is no station at Portland, the port to which the N. P. liner was bound, and it is said, had Captain Evans taken her to the Columbia with a case of small-pox on board, he would be liable to a heavy fine and, moreover he would have been ordered to some quarantine station. That at William Head being the nearest and the most completely furnished and equipped, he decided to go there. That he was satisfied with the treatment received at the station is shown by what he has to say in the following letter:—

'"Sir,—If not taking up too much of your valuable space, I should like very much to say a word on the fumigation of the steamship *Monmouthshire* at William Head. We arrived in the harbour on the evening of the 18th instant with one mild case of small-pox on board. We came alongside the quarantine station next morning, and found everything in readiness to commence fumigation, which was a great surprise. Having been at sea for nearly thirty years, and during that time having been in ships with every contagious disease under the sun on board, and having undergone the process of fumigation in all parts of the world, and having paid a certain amount of attention to the way in which it has been done, I must say that the various ports that I have been to could take a lesson from the efficient way and the courtesy shown to all by Dr. Watt and his staff at William Head. Still there is a point which none of us appreciated very much, that was going into a hot bath at midnight, and then having to walk over rocks about half a mile at 2 a.m., with the temperature at the freezing point, to the sleeping quarters, with our beds on our backs—like the pilgrims crossing the desert to Jerusalem. At the same time this was done by my sanction, and the kindness of Dr. Watt, who already had been, to my knowledge, about thirty-six hours on his feet, to facilitate the despatch of the ship, and at the same time doing everything thoroughly. More perfect it could not have been done if we had arrived in a plague-stricken ship. As there is a quarantine station to be built at Astoria shortly, I only hope that they will have as perfect an arrangement there as here, and I feel that I cannot leave the port without thanking Dr. Watt and his staff for his courtesy and the efficient manner in which he conducted the fumigation.

'"W. A. EVANS,

'"*Master.*

'"William Head Quarantine."'

In rather striking contrast to the mildness of the type of small-pox which has been prevailing in the United States, is the virulence of the disease as introduced from the Orient in April of this year. The following extract from the Winnipeg *Free Press* gives an account of this invasion of the disease:—

'At a special meeting of the city council yesterday afternoon, the question of small-pox quarantine was considered. At the quarantine hospital they had accommodation for only five to seven patients, while there are now fifteen cases in town.

'Dr. Inglis told the story of the outbreak. On April 13, Mr. Hector Finlayson was brought to the city with what has now proved to have been a malignant type of small-pox. The physicians in attendance saw nothing to indicate the nature of the case. Some of the staff of the hospital thought the case answered to the description of a certain type of small-pox, but their ideas were laughed at. The man died on April 15, and was placed in the morgue. The smallpox incubation period is twelve to sixteen days. Twelve days afterwards, two of the nurses were taken down with a rash, and on Thursday the advice of the health department was asked. They went up and took charge of the whole hospital at once. Coming from the west on the train, a number of people had been in conversation with Mr. Finlayson and exposed to the contagion; and many of them had also developed the disease. One of these was a train boy, who was selling newspapers, &c. Another was a travelling piano dealer; and another rode from Portage la Prairie in the seat opposite the sick man. These cases of infection occurred in various parts of the city, and the exposure had been absolutely unlimited. Up to the present time he had taken charge of fifteen patients, six from the hospital and nine from outside. Regarding the steps taken to stamp out the disease, it was a little too soon yet to do very much. The first thing was to try to find out the people who had been most thoroughly exposed, vaccinate, and disinfect premises. They had isolated all houses where cases had occurred, had removed patients to the pest-house, and had given instructions to prepare accommodation for twenty more cases. It looked as if the city were in for a first-class epidemic. He was afraid the exposure had been so great that the disease had got absolutely beyond control, like the Hull fire. He could not impress it too definitely on the council that they were face to face with a very serious situation. He knew of no epidemic, except that of Montreal in 1885, which had presented so serious an aspect as this on account of the exposure, and the absolute liberty with which the persons exposed had mixed with the public. A wire was received by Mr. Wood, from Secretary Fagan, of the British Columbia board, yesterday afternoon, to the effect that Finlayson arrived on the *Empress of Japan*, on April 5. He came from New Zealand, via Hong Kong, and was going east to consult a specialist about a kidney complaint from which he was suffering. He was fourteen days on the *Empress* on the passage across, and three days in Vancouver. The man showed no symptoms of small-pox at the time. Finlayson's case is said to be a remarkable one, as he had no exterior eruption, but was taken with a hemorrhage before his death.

'From the length of time which the original case, that of Finlayson, was exposed, and the number of people who came in contact with him, both during the trip from the coast and his confinement, there are naturally a large number of suspects, and two new cases of well-known gentlemen were reported.

'The first is that of Mr. O. H. Hatcher, general agent of the Deering Harvesting Company, who Thursday last was taken into quarantine. Mr. Hatcher boarded the Canadian Pacific Railway east-bound express at Regina on the 11th inst., and travelled in the same sleeper as Finlayson as far as Brandon. He remained off one day at that point and came into the city on the 12th, and has since that time attended to the duties of his office and made several business trips to the country. The day before yesterday he felt ill, and Dr. Hutchinson was summoned Friday. That gentleman at once recognized the disease, and Mr. Hatcher was removed to the quarantine.

'Mr. Chas. H. Forrester, of the Henderson Piano Company, met Finlayson on board the train under circumstances similar to those of Mr. Hatcher, and was taken to quarantine.

'A man whose name cannot be ascertained was taken off car No. 60 of the street railway yesterday, and the company at once took that car to the shops and are having it thoroughly disinfected.

'Some ninety patients were discharged from the general hospital between the 12th and 26th of this month, and these have scattered to all parts of the province and the Territories, and some even into Ontario. Mr. E. M. Woods, of the provincial board of

health, was busily engaged in wiring the local authorities at the different points at which the discharged patients are located that they—the patients—were exposed to infection by small-pox before being discharged from the hospital, and that they should be quarantined together with all persons in their present households.

'The sleeping-car on which the man Finlayson came through from the coast is the "Tokio." The provincial authorities have wired the British Columbia board of health informing them that the car is now at Vancouver, and asking them to detain it there until after it has been thoroughly cleansed and fumigated.

'The Brandon case is now pronounced to be small-pox unmistakably, and quite severe at that. A telegram was received at the provincial office yesterday morning asking whether permission would be granted to send the patient there to the Winnipeg isolated hospital for treatment. Mr. Wood replied that this could not be done, and that Brandon would have to take care of its own cases.

'The small-pox now prevalent is described by physicians as of a most infectious, malignant type of the Asiatic variety.'

In addition to the cases mentioned in this extract, others occurred also in Fort William, Port Arthur, Saw Bill, Sault Ste. Marie, Arnprior, Carleton Place and Montreal, all traceable to the Finlayson infection. Finlayson's case was indeed a remarkable one. Careful and continued inquiry led to the conclusion that he must have contracted the disease from the unpacking of infected articles during his voyage from Hong Kong. It will be noted that he was apparently quite well when he passed at quarantine, and during the three subsequent days that he spent in Vancouver before taking the train for Winnipeg.

Small-pox in the Yukon.—In July last, the commissioner of the Yukon Territory, telegraphed that smallpox had broken out at Dawson. By your instruction I at once proceeded thither. I found that the newspaper report that the disease had been brought by returning miners from Nome was not correct. All the cases were traceable to a man named Nixon, from Seattle, who had come down the river in a scow from White Horse and had gone on to the Eldorado creek. The first cases that occurred in Dawson were in the persons of two men who had come down on the scow with Nixon. The cases were seven in all, and were isolated on Dog Island, two and a half miles below the city. Recently some cases of small-pox have come down from the Forks to Dawson. These cases are doubtless attributable to the infection taken in there by Nixon.

Vessels and passengers coming up the river from Nome and St. Michaels were inspected at Dawson by the medical officer of the Yukon Council. And that Council had established a medical inspection of all arrivals from outside at their southern frontier by placing Dr. Paré, of the North-west Mounted Police, as quarantine officer at Caribou.

Mr. Ogilvie informed me that the question of a medical inspection at the frontier down the river, about 'Forty Mile', at the international frontier between the Yukon Territory and Alaska, between Dawson and St. Michaels on the Behring Sea, had been considered by the Council and held in abeyance, partly because of the protection given by the United States having quarantined at St. Michaels against all arrivals from Nome. No vessels come direct from Nome to Dawson. Seagoing steamships are required to cross the open part of the Behring sea between Nome and St. Michaels. These deep-sea vessels could not come up the shallow Yukon. Nor could the river steamers plying between Dawson and St. Michaels cross to Nome. The fourteen days of quarantine observation at Egg Island near St. Michaels of all arrivals from Nome, rendered the subsequent occurrence of small-pox contracted at Nome extremely unlikely amongst the arrivals at Dawson from down the river. I authorized the Council however, in your name, if the dire distress and disease at Nome should cause it to fear that any vessel might come up direct from Nome in the effort to get out from there before the river navigation should close, to at once send a medical inspector to examine all arrivals from below at Forty Mile.

At the other entrance—from Skagway—it was at once apparent from the Dominion standpoint that the inspection should be at the international frontier, and not only at the frontier of the Yukon Territory where alone the Council was authorized to place it, as it had very wisely done. The inspection at Caribou left British Columbia unguarded from Skagway, with Bennett, and all the Atlin and Teslin districts entered from there. Log Cabin, the first of our stations just on our side of the international line of the summit of the White Pass is evidently the proper Canadian inspecting point. The railway, the winter and summer trails converge there. There are there, and vacant, the former barracks, custom-house, and commissariat building, well adapted for hospital, doctor's residence and policemen's quarters respectively. With the consent of Major Wood, commanding the North-west Mounted Police, in the Yukon Territory, Dr. Paré was accordingly transferred to Log Cabin to inspect all arrivals over the White Pass from Skagway and the outside. Arrangements were also made for guarding the Chilcoot Pass and the Dalton Trail.

Whilst I was at Dawson, His Excellency the Governor General and Lady Minto visited that city. I officially placed my professional services at His Excellency's disposal. He was graciously pleased to accept them. I had therefore the honour of coming out with them on the return trip to Skagway as a temporary honorary surgeon on His Excellency's staff.

Transport 'Montezuma'.—On the 7th of January last I was requested by the Honourable the Minister of Militia to go to Halifax to form one of a medical board of inspection to investigate the cases of illness which had developed on the steamer *Montezuma*, and to report as to the advisability of allowing the said vessel to be used as a transport for Canadian troops for South Africa. I reached Halifax on the evening of the 9th January, and the board met the following morning. It consisted of Colonel McWalters, R.A.M.C., representing the Imperial authorities; Lieutenant Colonel Tobin, representing the Militia Department; Dr. E. Farrell, general representative; and myself, representing the Dominion Government, convener.

The board found that the *Montezuma* had left Cape Town on November 26th for New Orleans. The water on board was Mississippi river water taken below New Orleans for the voyage to Cape Town with mules and return. No water was taken at the Cape. The ship had taken more Mississippi water on board before starting for Halifax. The voyage from New Orleans to Cape Town took 29½ days. No cases of illness occurred on the way. The ship left the Cape on November 26th. What is now known to have been the first case of enteric fever (typhoid) on board reported ill on this voyage on the 12th of December. This man's illness was reported to the quarantine officer at New Orleans who thought he had suffered from malaria, but considered him fit for work. This man Kenyon was the only man off duty before reaching Halifax.

Some of the other cases that had to be taken to hospital at Halifax also date back to before the vessel reached New Orleans. They were of a mild type at first, the not unusual 'ambulatory' form, the men had not to keep their beds, and as before noted it was not recognized at the New Orleans quarantine, nor considered serious at Halifax until some days after the vessel reached that port. We found eight cases of decided enteric fever from the vessel in the city hospital. On inspecting the crew we found a ninth case, which was sent to hospital. Also eight others on board with history of diarrhœa, and with abnormally high temperatures, although still at their work: cases certainly to be regarded as suspicious under the circumstances.

I submitted to the board that in my opinion the source of infection was traceable to the Mississippi river water, or to impure water drank at the Cape, and that the cases subsequent to the first one may have arisen from such impure water, or from the first case. Assuming all these sources of infection to be accepted, still the suspicious parts of the vessel would be confined to the water in the tanks, to the crew, and the parts of the vessel they had occupied. That in my opinion the crew, from the captain down, should be taken out of the vessel; all fresh water tanks be emptied, disinfected by

steam and refilled with fresh water; and the vessel taken to quarantine and all apartments, latrines, etc., thoroughly treated there. That if that were done I considered any recurrence of the disease in the highest degree improbable.

The other three members of the board, while recognizing the value of modern methods of disinfection, were unanimously of the opinion that the report of this board should be a recommendation to the government against the use of the ss. *Montezuma* as a troopship. Surgeon-Colonel McWalters dwelt specially on the point that the occurrence of even one case amongst the troops might cause their delay at the Cape or in camp in quarantine at a time when it might be vital that every man should be hurried to the front. He was emphatic in the unqualified condemnation of this vessel, and expressed confidence that that course alone would be approved by the Imperial authorities. In this view he was supported by Dr. Tobin, as representing the Militia Department, and by Dr. Farrell, as representing the general public.

Many years' experience of the appliances of your quarantine system, and repeated perfect success with much graver infections than that of enteric fever, justify my confidence that there is no vessel, however infected, that cannot be rendered perfectly safe by the proper use of our modern appliances. And as a matter of fact it may here be stated that inquiries have proved that no further case of enteric fever developed on the *Montezuma* after her disinfection at Halifax.

But I need hardly add that I fully recognize that it would not have been right for the Government to act on my minority report in face of the strong objection to the employment of the vessel as a troopship under any circumstances, held by the other members of the board and—to judge by the newspapers—very generally by the public also.

Samples of the water in the tanks were sealed up and sent to Montreal for bacteriological examination, and the typhoid bacillus was found in it by all the standard tests.

It would seem likely, from the history of the vessel, that there were a few microorganisms of this disease in the water taken below New Orleans, and that they increased and multiplied in the tanks, under the favouring conditions of the darkness, and of the heat in twice crossing the equator.

The Epidemic Dysentery of Japan.—Dr. Stuart Eldridge has submitted to the surgeon-general of the marine hospital service an interesting report (*Public Health Reports*, January 5, 1900) on the severe epidemic of dysentery which has been prevailing in Japan for the past twenty years. Beginning in 1878 in the south, the disease has gradually spread from island to island until it has invaded practically the whole extent of the Japanese empire. It has been attended by a very high mortality, and this mortality throughout the whole epidemic has been remarkably constant. The total number of reported cases is 1,136,096 with 275,308 deaths, the percentage for the whole period being 24·23. In some periods the mortality has risen as high as 27 per cent. So far but little success, according to Dr. Eldridge, has attended the efforts of the officials to control the disease or to limit its extension. Recently the general government has taken the matter out of the hands of the local authorities, and in consequence the prospect of thorough sanitary control is brighter. The chief difficulty in Japan, as in so many other oriental countries, is the absolute ignorance and indifference of the populace. The people pollute the streams by throwing the dejecta into them, and then drink from these contaminated sources. It is gratifying to know, however, that the Japanese, who are reputed to be a bright people, are beginning to appreciate the fact that the sanitary regulations of the government are for their good.

The disease itself is evidently a virulent form of bacterial infection. It is attended by bloody and purulent discharges which are the evidences of an acute catarrhal and ulcerative process in the colon and rectum especially. A nervous type of the disease is seen, in which the patient is overwhelmed by systemic intoxication. The Japanese pathologists, Kitasato, Shiga, and others, have studied the disease with scientific care and accuracy. Shiga has published in the *Centralblatt für Bacteriologie*, Band

xxiv., the results of his studies. He believes that he has found the specific cause of this epidemic in a short rod of about the same size as the *bacterium coli communis* and morphologically very similar to the bacillus of typhoid fever, but not identical with either. Shiga has prepared an antitoxic serum which has proved successful, reducing the mortality as low as 8 per cent, while hospital cases under the ordinary medical treatment were giving a mortality as high as 37 per cent. The cost of the serum is the great obstacle to its extended use. Dr. Eldridge, in conclusion, states the reasons for believing that this epidemic dysentery is distinct from both plague and cholera; it is also not to be confused with ordinary amebic dysentery.

Protective Inoculations for Enteric Fever.—Numerous efforts have been made to obtain a serum capable of conferring immunity to typhoid fever and of exerting a curative influence on the developed disease, but hitherto without satisfactory evidence of success. Inasmuch as the disease is one of which an attack confers relative protection from subsequent attacks, it does not seem unreasonable to hope that we shall eventually come into possession of an effective antitoxin. Although the lower animals are not susceptible to typhoid fever as commonly observed in human beings, there develops in them a form of septicemia, to which, however, immunity can be induced by the use of heated cultures of typhoid bacilli or of the filtrate from unheated virulent cultures, or of cultures in thymus-bouillon. Some attempts made by A. E. Wright, professor of pathology in the Army Medical School, at Netley, England, in conjunction with successive associates, to produce these results in human beings would seem to have attained a measurable degree of success, and they are particularly interesting at this time from their bearing on the vaccination by the same method of recruits for the British army in South Africa. In the latest communication on this subject, Wright and Leishman describe the method for obtaining the vaccin and the results of its employment, in so far as these can at present be estimated. The inoculations were made on troops in India, the vaccin being largely prepared as required. This consisted in part of a four-weeks-old culture of virulent typhoid bacilli, with 1 per cent of lysol, sterilized by exposure to a temperature of 60 C., or of a twenty-four-hour-old culture, the dose of the former employed for each inoculation being from ·5 to ·75, and of the latter from ·3 to ·5 c.c.—the minimal fatal dose for 100 grams of guinea-pig; 2,835 men were inoculated. Among these there occurred twenty-seven cases of typhoid fever (·95 per cent) with five deaths (2 per cent), as compared with 213 cases (2·5 per cent) and twenty-three deaths (·34 per cent) among 8,460 uninoculated persons. These results become the more conspicuous from the fact that the inoculated included principally young and unseasoned men, while the uninoculated included older and more seasoned ones.

Again, the official statistics with regard to the results obtained in the beleaguered military garrison at Ladysmith, as cited by Wright (*Lancet*, July 14, 1900, p. 95), show that among 10,539 non-inoculated individuals there occurred 1,489 cases of typhoid fever—a proportion of 1·707; with 329 deaths—a proportion of 1·329 of the whole number, and of 1:4·52 of the number of cases; while among 1,705 inoculated individuals there were thirty-five cases of typhoid fever—1:48·7; with eight deaths—1·213 of the whole number, and 1·4:4 of the number of cases. Briefly stated, the figures demonstrate an almost sevenfold reduction in the morbidity and in the total mortality among the inoculated, with little alteration in the case mortality, but this latter fact may be in some degree dependent upon the small number of cases dealt with. It has further been reported that the disease pursued a milder course in the inoculated than in those not inoculated. There was no reason to believe that the remaining conditions to which inoculated and uninoculated were respectively exposed exerted any noteworthy influence upon the result. While perhaps these observations can not be looked on as conclusive, they indicate at least the harmlessness of the procedure employed, and they justify the hope that we shall soon have a means of diminishing the prevalence of, as well as reducing the mortality from, enteric fever, just as these things have been done for small-pox, for hydrophobia and for diphtheria.

Beri-Beri.—C. Norman enumerates and discusses the following features of beri-beri:—Disturbances of sensation, exaggerated reflexes, later diminished; paresis of the peroneal muscles and foot flexors, affections of other muscles, eye symptoms, absence of sphincter paralysis, later muscular atrophy; joint relaxation, cardiac palpitation, gastric weight and discomfort, and finally œdema. The great danger always present in this disease is sudden heart failure.

According to Manson, beri-beri is a place disease. Overcrowding seems to favour the outbreak of the disease, such conditions create an incubator on a large scale, which should it chance to contain a beri-beri germ, quickly becomes extensively infective and lethal. He does not think, however, the germ lives as a parasite in the human body, or that it exercises its pathogenic powers in a direct way, or that it passes from one human being to another, like the germ of the ordinary infectious or directly communicable disease. He suggests it is possibly caused by a toxin generated by a germ living in the patient's surroundings.

Yellow Fever.—The experiences and reports of the year have been on the whole adverse to the claims for Santorelli's *bacillus icteroides* as the causative micro-organism of this disease, and for his serum as a preventive or curative agent. During the year a fresh claimant for this honour has appeared in Dr. Angel Bellinzaghi, as is shown by the following which has been published as a Mexican cable to the *New York Herald*:

'Dr. Angel Bellinzaghi, a well known physician in Brazil, has discovered a new serum which is believed to be efficacious against yellow fever. The serum was tested successfully on several cases in Rio Janeiro.

'Dr. Bellinzaghi arrived in this city last week and began treatment on David Kilpatrick, a patient in the American Hospital here. In Kilpatrick's case the serum was injected at the end of the fourth day. It is announced that he will recover.

'Dr. Bellinzaghi has arranged with the government to try the serum in Vera Cruz, where an epidemic of yellow fever is now raging, as well as in Coatzacoalcos and the Isthmus of Tehuantepec.'

Leprosy.—Dr. Fox, of New York, adds his testimony to that of so many others, as to the value of chaulmoogra oil as a remedy in this disease.

Dr. Ehlers, of Copenhagen, has during the year reviewed the subject of the mercurial treatment of leprosy, and gives some curious and interesting historical details, including a reference to the Icelandic practitioner, Jon Pjétursson, who in 1769 wrote a book in Danish to explain his treatment of 'Iceland scurvy', that is, leprosy, by means of mercurial preparations given by the mouth. Coming to the more recent attempts to deal with leprosy by intramuscular injections of perchloride of mercury, made by Radcliffe Crocker and Haslund, both of whom have had encouraging results up to a certain point (the former in several cases, the latter in one only), Ehlers states that Bjarnhjedinsson and Bjornsson in Iceland have also obtained satisfactory results on these lines. This is further confirmed by Neish in his report on the Lepers' Home (Jamaica, 1899), who has applied Radcliffe Crocker's method to 66 selected cases of leprosy, those suffering from nephritis or cardiac complications being excluded. Neish is reported as stating that in every case the effect has been most strikingly beneficial, and in his conclusions briefly summarizes the results, observed as follows: Restoration of sensation, disappearance of the nodules, rapid cicatrisation of ulcerations, improvement in the general mental attitude in the direction of cheerfulness, etc. Neish proposes to pursue the experiment.

Darcy Island.—Whilst in British Columbia this summer I visited the leper establishment at Darcy Island unofficially. There are five lepers there, all Chinese males. One is maintained by the province, and one each by the municipalities of Victoria, Vancouver, Nanaimo and Kamloops.

Transmission by Insects.—In connection with the recent theories as to the transmission of plague by fleas from rats, and of yellow fever as well as malaria by the musquito, Nuttall's observations are of interest. He reports tests (*Cbl. f. Bakt.*,

xxxiii, 15) which show that when bedbugs and fleas bite, by their sucking they remove any micro-organisms that may be introduced by their bite. But infection may occur if the insects are crushed on the skin and the bitten spot scratched.

The Public Works (Health) Act.—His Excellency the Governor General in virtue of the provisions of this Act and with the advice of the Queen's Privy Council for Canada has been pleased this year to make regulations for the preservation of health and the mitigation of disease among persons employed in the construction of public works. The carrying out of these regulations to be under your administration, and any act of the Health Board to be subject to your revision.

The regulations defining the constitution of the officers and health board are as follows:

There shall be appointed by the Governor in Council a superintendent under the said Act, whose duty it shall be—

(*a*) To see that the regulations under the said Act are enforced and complied with on every 'public work' or 'works' to which they are applicable.

(*b*) To report and recommend from time to time such additions and changes in said regulations as shall the more effectually promote and secure the intent and object of the Act.

(*c*) To act as chairman when present at all meetings of the health board.

(*d*) To notify the chief provincial health officer from time to time of all cases of contagious or infectious diseases on any 'public work' or 'works.'

(*e*) To receive reports from the medical staff engaged upon the work.

All matters of importance under the Act shall be reported by the medical officer to the superintendent.

The health board shall consist of the superintendent, all medical men engaged on the said 'public work' or 'works,' the government engineer in charge of the same, and in his absence any government engineer engaged on the works, or designated by the governement.

A quorum of the health board shall consist of at least three members, of whom in the absence of the superintendent the government engineer in charge or other government engineer on the works or other engineer as the case may be shall be one, provided that where two medical men cannot conveniently meet an additional government engineer may complete the quorum; provided that any act of the board shall be subject at all time to be revised or superseded by the Director-General of Public Health on reference from the superintendent.

Official Inspections, etc.—On January 8, I proceeded to Halifax, as above detailed, for the inspection of the proposed troopship *Montezuma.*

While at Halifax I had opportunities of inspecting the quarantine station at Lawlor's Island.

Returning by way of St. John, N.B., I inspected the quarantine station at Partridge Island.

On May 3, I went to Quebec to inspect the steamers *Kathleen* and *Contest,* and report to you upon their respective suitabilities as a disinfecting, etc., steamer for the St. Lawrence quarantine.

On July 24, I started for Dawson, as above mentioned, going by way of Vancouver. Returning, I reached Victoria on September 1, and inspected the quarantine station at William Head. I visited Seattle, to study the small-pox situation there. Thence I passed by Huntingdon, and along the frontier inspection posts, between British Columbia and the United States. I came in by the Crow's Nest Pass to Winnipeg, and reached Ottawa again on September 26.

On October 20, I left to attend the annual meeting of the American Public Health Association, held this year in Indianapolis, Indiana. The meeting was a valuable and instructive one, many sanitarians from the United States, Canada and Mexico being present.

In returning, I visited the New York quarantine, and through the courtesy of Dr. Doty, saw the new improvements there.

THE QUARANTINE STATIONS.

Grosse Isle.—At Grosse Isle, Que., in the St. Lawrence, and at its sub-station of Rimouski, Que., 407 vessels have been inspected this year, 374 at Grosse Isle and 33 at Rimouski. The number is less than in previous years. Each large vessel now being built represents a carrying capacity of several of the smaller ones formerly employed. There were 5,000 more passengers inspected than last year. Admissions to hospital 40: deaths 2, 1 from small-pox, 1 from enteric fever. The works for the introduction of a water supply for the hospital were commenced.

William Head, B.C.—Some 23,000 Chinese and Japanese passengers have been bathed at this station this year and their effects disinfected. Observation and disinfection at the ports of departure, long hoped for, is being inaugurated. Number of vessels inspected 360. Diseases : small-pox, dysentery, beri-beri and diarrhœa. One death from small-pox, one from diarrhœa.

Victoria, B.C.—Since May 3, your ministerial order has been suspended which excepted vessels from San Francisco and ports north of it in the United States from the provisions of the quarantine regulations. All vessels arriving at Victoria even the daily boats from Puget Sound ports and from Alaska have therefore been inspected. This was rendered necessary by the presence of bubonic plague in San Francisco, and small-pox in the neighbouring states.

Vancouver, B.C.—At this port 223 vessels were inspected, including some from neighbouring United States ports since May 3. Small-pox was found on the ss. *City of Seattle*, from Skagway and Ketchikan, Alaska. This vessel was accordingly sent to the William Head station, for observation and disinfection. Her passengers are still under observation there.

Halifax, N.S.—Vessels inspected 329; an increase of 43. A 40,000 gallon tank has been installed at the highest point of this station for flushing, supplying baths, etc., with salt water. This will make drainage possible. The steerage building put up for the Doukhobors near the first class building has been converted into a detention building for intermediate passengers.

St. John, N.B.—176 vessels inspected, an increase of 33 over last year. Enteric fever and diphtheria were found amongst the arrivals. The new buildings at this station are now ready to be furnished. Action has been taken for the completion of the water supply.

Sydney, C.B.—Vessels inspected 168, no infectious disease.

Charlottetown, P.E.I.—Vessels inspected 11, no infectious disease.

Chatham, N.B.—Vessels inspected 102, no infectious disease.

Leper Lazaretto, Tracadie, N.B.—Four deaths during the year, and three new admissions. The present number of lepers in this institution is 20; 13 males and 7 females. Dr. Smith has noted encouraging results from his trials this year of chaulnoogra oil and creolin.

I have the honour to be, sir,

Your obedient servant,,

F. MONTIZAMBERT, M.D. Edin., F.R.C.S., D.C.L.

Director-General of Public Health.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 2.

OFFICE OF THE MEDICAL SUPERINTENDENT,
GROSSE ISLE, QUE., October 31, 1900.

SIR,—I have the honour to submit my annual report of the St. Lawrence Quarantine Service to October 31, 1900.

Three hundred and seventy-four (374) vessels presented themselves for the inspection at this station during the present year.

This number of vessels inspected shows a decrease over the last year, owing to the fact that many steamers coming generally by this route have been chartered by the British government for transporiation of troops, munitions, &c., to South Africa; and also, that many having stopped at Sydney, N.S., to take coal, had received their clearance from that port before passing here.

But, although the number of vessels has decreased, the number of passengers inspected shows an increase of more than five thousand (5,000) over the last year.

We have examined 45,187 persons in all, divided as follows:—4,202 cabin, 4,838 intermediate, 17,738 steerage passengers and 18,409 crew.

The only vessel that seems to call for special remarks is the following:—

The ss. *Montblanc*, Cronzat, master, having sailed from Bordeaux (France) on June 24, with 2 cabin, 229 steerage passengers and 35 crew, arrived at the station on July 10, at 11 p.m.

On her arrival, the captain and surgeon having reported cases of small-pox, the steamer was stopped until daylight of the next morning to be inspected.

We went on board early on the morning of the 11th, and on inspecting the hospital, which was placed on the 'bridge deck,' and isolated from the part occupied by the rest of the passengers only by a slight partition of board, we found that there were five persons of the same family, including the father, the mother, one girl aged ten years, one boy aged seven years, and a little baby aged six months, and three of them, the father, the girl and the boy, were taken with confluent hemorrhagic smallpox, and were in the full period of eruption of the disease.

The captain and surgeon declared more, that one girl, aged eighteen years, of the same family, died of that same disease during the voyage, and was buried at sea.

The record of voyage shown to us stated that the first case developed on July 4, and the other ones on the 5th, and it is really surprising that the disease did not spread more, considering that the surgeon on board had no vaccine at his disposal, and that not one of the passengers and crew had been vaccinated before or after embarking.

We ordered the captain to have his steamer anchored near the station, and having removed the sick to the hospital, we began immediately the landing of passengers, with their baggage.

The vaccination, the disinfection of baggage, clothes, bedding, &c., with steam disinfector and formaldehyde took place on the 12th, and on the same day we gave the needle baths with antiseptic solution of chloride of mercury.

The disinfection of the steamer began on the 13th, the methods employed being formaldehyde, steam, mercuric chloride solution and sulphur dioxide gas, under pressure from blast furnace.

I beg leave to say here that the sulphur dioxide blast disinfecting appliance, installed on ss. *Kathleen*, has been a great convenience for the disinfection of that part (bridge deck) occupied by the sick and the passengers. After having pulled

down the wooden beds, to be landed and burned, we introduced into one of those compartments measuring 16,907 cubic feet, one hundred and fifty pounds of sulphur, and in the other one, measuring 6,431 cubic feet, 65 pounds, making about ten pounds per 1,000 cubic feet.

The disinfection of the steamer was completed on Sunday, the 13th, and a telegram was immediately sent to the agents in Montreal and Quebec, stating that the steamer, having been disinfected in every part, could proceed if they sent a new crew to take charge of her, but Mr. Poindron, the agent in Montreal, replied that the owners and insurers of the ss. *Montblanc*, which had been chartered by the 'Compagnie Franco-Canadienne,' would not allow their steamer to proceed with a new crew, unless their captain and chief engineer be on board, and asked me under those peculiar circumstances to release those two officers; so I wired that fact to the department, to be advised and relieved from all responsibility, pointing out that, if permission was given to those two officers to proceed without having completed the full period of observation, the rest of the crew and passengers could and would not understand and accept that preference and distinction, and it would be a dangerous precedent; the answer to my telegram being that there could be no distinction made with regard to infectious disease; captain and engineer were just as dangerous as any one else, and should undergo same observation, so the steamer could not and did not proceed before the crew had completed the full period of observation.

On the 16th, one of the sick in the hospital, the girl aged ten years, died from infectious endocarditis (complications of small-pox), and the little baby, aged six months, presented symptoms of fever, and 6 days after he was in the full period of eruption of smallpox.

On the 22nd, one of the passengers (woman) detained as suspicious, and who had been vaccinated successfully twice, the first time on the 11th, and the second time on the 17th, complained of pain in the abdomen and presented some rash on the skin, so we removed her from the upper division to the hospital for observation, and on the 25th, the rash having increased and presenting all the appearances like, we diagnosed it as a case of varioloid.

As that woman had had communication with some of the passengers, we began again the disinfection, the bathing, &c. We drenched, with a solution of chloride of mercury, the sheds occupied by them, and they were detained seven days more in observation.

The passengers and crew which had been detained as suspicious, having been vaccinated and bathed, and their baggage, clothes, &c., disinfected, left the station—crew with the ss. *Montblanc*, on July 31, and passengers with the tug *Beaver*, on August 6.

The convalescents were discharged from the hospital at quarantine, and left the station on September 18.

Infectious diseases of minor importance were reported or found on board of the following vessels:—ss. *Lake Superior, Parisian, Tunisian, Tritonia, Lake Megantic, Corinthian, Numidian, Devona, Bengore Head, Torr Head.*

The diseases so reported and discovered were scarlet fever, measles, chicken-pox and enteric fever. All those sick were removed with attendants to the hospital, and the vessels proceeded, after having had their hospitals disinfected.

The admissions to hospital numbered 40.

The deaths numbered two, one from small-pox and one from enteric fever.

The ss. *Lake Superior* landed for burial at quarantine the body of a child, who died shortly before from bronchitis.

BUBONIC PLAGUE.

In accordance with instructions from the department, we have made careful inspection of vessels coming from Glasgow, owing to the outbreak of the bubonic

plague at that place. In order to make the most rigid and careful inspection, all vessels arriving from that port at night were directed to anchor and await daylight to allow the examination of every one on board.

SS. *Buenos Ayrean*, having sailed from Glasgow on September 8, arrived at the station on the 20th, with 11 cabin, 91 intermediate and 121 steerage passengers. Owing to the great number of passengers she carried and to the date of her sailing, which corresponded with the time that the disease spread so much in Glasgow, this vessel was detained three days under observation to complete the fifteen since the last exposure, and she was released on September 23.

Acting under instructions from the department, all vessels from Glasgow via Sydney, N.S., were reinspected here owing to the long distance between that last port and Quebec.

QUARANTINE STAFF.

The Rimouski substation continued to be in charge of Dr. A. Lapointe, who made the inspection of the weekly mail steamers.

I visited from time to time this advanced post, and coming up on the mail steamers I inspected them thoroughly en route between Rimouski and Grosse Isle.

The number of staff at Grosse Isle had also to be increased to meet the larger addition of work during the year.

IMPROVEMENTS AND REQUIREMENTS.

The ss. *Kathleen*, hired by the department this year, has proved to be of great convenience and necessity to act as mail and supply boat between the station and Quebec; to convey passengers discharged from the hospital at quarantine, to carry the sulphur furnaces out to fumigate infected vessels, and most important perhaps of all, to act as a reserve inspecting steamer in place of *Challenger*.

I beg leave therefore respectfully to suggest that you should build or purchase one steamer with screw, if possible a duplicate of *Challenger*, because it is very inconvenient and dangerous in rough weather or at night to come alongside the steamers with a paddle boat.

It would be greatly in the interest of the shipping, as well as of all concerned.

The great deficiency continues to be that of a deep-water wharf, a wharf to which infected vessels would be brought to land their passengers and baggage for disinfection.

During the present year many works and repairs were made at the station, and I may perhaps be permitted to express here my satisfaction to see that the waterworks for the hospital are begun; this is certainly one great improvement in the interest of the sick and of the station.

One of the most important wants for the hospital should be to have one steam laundrying disinfecting apparatus, so as to prevent the spread of the different diseases by the upholding or the washing of dirty or contaminated linen, and to sterilize the baggage, bedding, clothes, &c., belonging and having served to the sick and attendants removed to the hospital.

There are still some other works and repairs absolutely necessary which have been asked, and the list for which is in the hands of the Public Works Department.

The whole respectfully submitted.

I have the honour to be, sir,

Your obedient servant,

G. E. MARTINEAU, M.D.

To the Honourable
The Minister of Agriculture,
Ottawa.

No. 3.

QUARANTINE STATION,
HALIFAX, N.S., October 31, 1900.

SIR,—I beg to submit my annual report of the work done at this station during the year ending October 31, 1900.

We were entirely free from the graver forms of quarantinable diseases at this station during the year just closed, and we only met with a few cases of the minor forms.

On January 1, the ss. *Montezuma* arrived in port from Cape Town, South Africa, via New Orleans, with a case of enteric fever on board. By the 10th of the month nine cases had broken out amongst the crew.

The facts of the case are as follows: One of the crew took sick on the coast of Africa on the voyage from Cape Town to New Orleans. When the ship arrived at the latter port, the quarantine officer examined the patient carefully, and found his temperature registered 100° Far., but he did not anticipate anything very serious being wrong with the man, and he admitted the vessel to free pratique, and subsequently gave her a clean bill of health. While in New Orleans they filled one of the tanks with Mississippi water for drinking purposes. Thence the ship sailed for Halifax on December 23, 1899, and arrived here on January 1, New Year's Day. No one complained of being ill when they arrived in port except the one man. It being New Year the day the vessel arrived in port, each of the crew was given a sovereign, and most of them came ashore and had a regular blow out, and as a result some slept all night in a snow bank. A day or two later two or three of them took sick from exposure, as the captain thought, but their sickness lapsed into typhoid fever. All those who took sick occupied the forecastle except two. At first it was thought the disease originated from the drinking water which was taken from the Mississippi and might have been infected. But this could not be so, for from 90 to 100 mechanics who were fitting up the ship drank the same water for seven or eight days, and none of them contracted the disease. In view of this fact, and also of the fact that all the sick except two lived in the forecastle, we came to the conclusion that the water was not at fault. I am satisfied that the disease came from South Africa, and that it spread in the forecastle by contagion.

The vessel was disinfected in the following manner: The mattresses in the forecastle were destroyed, and the forecastle disinfected with formaldehyde gas and flushed with mercuric chloride solution, 1 in 800, as was also all the apartments occupied by the sick. The bilges were flushed with sea water and pumped dry, after which they were freely flushed with mercuric chloride solution, 1 in 800. This solution was left in the bilges for some time. The water tanks were emptied and subjected to the action of steam for eight or nine hours. They were then filled with fresh water.

When the vessel left port for New Orleans I gave her a clean bill of health, and I have since made inquiries and I feel pleased to be in a position to state that no case of fever developed after the vessel was disinfected.

The ss. *Cambroman* arrived from Liverpool on April 9, with a case of enteric fever on board; the ss. *Assyria*, from Hamburg, May 18, had four cases of scarlet fever amongst three Galician families. These, with their respective families, were sent to Lawlor's Island, and were kept there till desquamation had ceased. One family was detained there for six weeks. No new case originated in quarantine.

One death occurred, that of a child, who was all but dead when he arrived in port. They were all bathed and their effects disinfected before being discharged. On June 25 the ss. *Swanley*, from Florida, arrived with the captain sick with typhoid fever. He was sent to the V. G. Hospital for treatment. The schooner *E. B. Wade*, from Antigua, W.I., August 12, reported one death from pulmonary tuberculosis on the voyage. The ss. *Arcadia*, from Hamburg, June 2, reported six deaths from broncho-pneumonia on the passage, and the ss. *Numidian*, from Liverpool, March 26, and the schooner *Wanola*, from Philadelphia, March 29, reported each a death from pneumonia.

A few cases of tinea favosa arrived amongst the immigrants from Europe, but as there is nothing in the quarantine regulations prohibiting persons suffering from this disease from entering Canada, they were allowed to land. Some of these were bound for the United States, but the United States immigration commissioner at this port would not allow them to proceed, so they were stranded here. The agents of the ships, however, looked after their welfare.

The number of vessels inspected at this station during the year was 329. This is 43 in excess of last year. This shows that the station is growing in importance yearly; 31,189 were examined, as follows:—Cabin passengers, 1,427; second-class, 1,611; steerage, 16,057; crew, 11,666. This is only an excess of 202 souls over the previous year.

The following improvements were made at the station during the year:— A concrete tank, with a capacity of about 40,000 gallons, was constructed on the highest point on the island, and connected by pipes with the different buildings, and with the force pump in the disinfecting house. This enables us to use sea water for flushing and baths, and so saves the well water for drinking and culinary purposes. We need a few more surface wells.

The temporary building erected in February, 1899, to accommodate the Doukhobors was converted into a first-class building for intermediate passengers, and a road was constructed from the south-east corner of the disinfecting house to connect with the two steerage detention buildings. This enables us to convey the disinfected effects from the disinfecting house to the detention buildings without mixing up, as in the past, with the infected effects.

The following vessels have arrived from Glasgow since the outbreak of bubonic plague in that place:—The ss. *Siberian*, on September 15 and October 29; the ss. *Carthaginian*, October 2; the ss. *Assyrian*, October 6; the ss. *Corean*, October 15. Each of these vessels were examined in daylight in mid-stream. No sickness was found on board of any of them. In every instance funnels were used on the hawsers after the vessels docked, and when it was found necessary to keep a gangway open at night, a man was kept watching it to see that no rats left the ship. I found the agents of these vessels most anxious to carry out all the regulations issued by the department.

We have distributed Danysz rat virus along the public wharfs and buildings on two different occasions. The food used was loaf bread, and it was prepared in every detail according to the directions accompanying the virus. The first was distributed four weeks ago, and the second two weeks later. I have carefully watched the results, and I must say they have not been very satisfactory. No dead rats have been seen lying about wharfs or public buildings, and in only one or two instances was there any apparent diminution in the number of rats usually seen about these places.

To make the station still more efficient, I would recommend that the following additional improvements be made:—That a covered passage-way be built behind the disinfecting house, extending from the bath-house to the south end of the disinfecting house, so that the bathed could leave the bath-house without having to mix up, as at present, with the unbathed and their infected effects. I would further recommend that a fence be built from the south-east corner of the disinfecting house, extending up the hill between the two steerage detention buildings, to connect with the fence across the road leading to the hospital. If this was done, one of the buildings could

be used for the reception of the immigrants, with their infected effects, while the other could be used for the reception of the bathed and their disinfected effects, and no intermingling of the bathed and unbathed and their infected and disinfected effects would be allowed till disinfection is complete. By such an arrangement as this disinfection could be carried out scientifically, but not otherwise.

There is one other matter to which I desire to call your attention, and that is the use of cesspits at the station for the reception of human excreta. Cesspits are condemned by the best authorities on sanitary science. In the event of the graver forms of quarantinable disease appearing on the island, these pits would become pest holes for propagating disease. The buildings should be drained into the harbour.

I have the honour to be, sir,
Your obedient servant,

N. E. MACKAY,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 4.

SYDNEY QUARANTINE STATION,
NORTH SYDNEY, November 3, 1900.

SIR,—I have the honour to present my report for the year ended October 31, 1900.

The number of vessels inspected this year exceeds that of any year since I have taken charge of the quarantine station here.

A new feature in the quarantine work at this port is the arrival of a large passenger list on a number of the different steamships calling here.

The total number of ships inspected for the year now ending number 168.

Steamboats, 138 ; sailing vessels, 30 ; transatlantic, 117 ; cisatlantic 51.

I am glad to say that there has been no case of quarantinable disease in this port during the year.

All ships have as usual been carefully inspected, particularly those from Glasgow, since the bubonic plague has been reported there. The buildings, &c., at the station are in good condition.

I have the honour to be, sir,
Your obedient servant,

HORACE RINDRESS, M.D.

To the Honourable
The Minister of Agriculture,
Ottawa.

No. 5.

QUARANTINE,
ST. JOHN, N.B., October 31, 1900.

SIR,—I have the honour to submit my report for the year ending October 31, 1900.

One hundred and seventy-six vessels have been inspected. This is an increase of thirty-three over the previous year.

On December 3, the brigantine *Culdoon* arrived from Malta in a dirty condition and infested with rats. She was held and disinfected as a precaution against the plague. Pratique was granted December 4th.

The ship *Lennie Burrill* arrived from Buenos Ayres on December 18. She was held and disinfected as a precaution against plague.

At the inspection of the crew of the ss. *Alcides*, which arrived from Glasgow February 9, one seaman complained of dizziness and diarrhœa. His temperature at the time (10 a.m.) was 102° F., and his pulse 102. He was isolated and re-examined at 4 p.m., when the temperature was 103° F. and the pulse 108. Other symptoms pointed to enteric fever as a probable diagnosis. The patient was sent to hospital; the forecastle was thoroughly cleansed and disinfected; the water-closets scrubbed and painted, and the water-tanks emptied, disinfected and re-filled. The ship was not detained. The diagnosis proved to be correct. There were no other cases.

SS. *Sylviana*, which arrived from London, March 14, presented a case of diphtheria in the person of the 3rd officer. The patient was isolated, and under antitoxine made a rapid recovery. Preventive measures were successfully applied. The ship was not detained. A case of tuberculosis in the person of a fireman on the same vessel was sent to the General Public Hospital for treatment.

On May 21, the ss. *Nile* arrived from Baltimore with eight cases of itch among the crew. At the request of the master, I intervened with our sanitary appliances and cut the epidemic short.

On May 28, the ss. *Tiber* arrived from Demerara and the West Indies. The mate reported that the master, Captain Delisle, had died nineteen hours before reaching port, and that his body was still lying in his room on the bridge deck. Careful investigation revealing no evidence of contagious disease, I granted pratique, and also, on the receipt of instructions from the department, gave permission to land the body in a sealed coffin for removal to his late home in Quebec, for burial.

The very next vessel to arrive also reached port with the dead body of her former captain on board. This was the barque *Scillin*, which arrived from Genoa on May 30. The mate reported that Captain Schiaffino had died at 5 a.m., May 29, after five days' illness. The history elicited at my examination was clearly that of apoplexy. There was no evidence of any contagious disease. I granted pratique and gave permission to land the body for burial.

On June 12, the barque *Luigina* arrived from Rotterdam. One of the seamen presented an axillary bubo of a suspicious character. The vessel was detained until the completion of a bacteriological examination of pus from the bubo determined the absence of the bacillus pestis. The case proved to be one of staphylo-coccus infection.

On September 14, the ss. *Tanagra* from Glasgow, was detained, disinfected and her crew bathed, as a precaution against the plague. Pratique was granted the next day.

Twenty-eight cases of tuberculosis and thirty-two cases of venereal disease have also been observed on ship board during the year.

During the course of the annual meeting of the Maritime Medical Association held this year at St. John, July 17-19, the members were given an excursion to the quarantine station on the afternoon of July 18. Eighty members attended. Luncheon was served in building B, by the kind permission of the contractor, and in the speeches which followed were many favourable comments on the character of the buildings which are being erected here.

The recent growth of the shipping trade at this port and particularly the advent of transatlantic lines of steamships carrying passengers, compelled the erection of quarantine buildings of a suitable character. Preliminaries having been arranged and money cheerfully granted for the purpose, ground was broken for the foundation of a new hospital on November 14, 1899. This building, as well as a new building to accommodate the officers and crews of detained vessels, and a detention building for immigrants are now completed and ready to receive furniture and fittings which have been ordered for them.

A contract has been given to Mr. D. P. Kent to sink an artesian well at this station. This is a most important work, the beginning of which has been delayed in part at least by the discouragements gratuituously bestowed by some whose interests in securing a suitable water supply are hardly as great as are those of us who would be held responsible for its absence in the time of some grave emergency. I confidently look for a successful outcome to the experiment, which is shortly to be begun.

The necessity for telephone communication between the station and city having become recognized, five thousand feet of deep sea cable were procured from the Department of Public Works through the courtesy of the Honourable Minister. This was put down between Partridge Island and Fort Dufferin on December 7, 1899, by Mr. Douglas Wetmore, and a crew from the staff of the Western Union Telegraph Company. Authority having been secured, a contract was made with the New Brunswick Telephone Company to erect and maintain the land line between the Fort Dufferin end of the cable and their control exchange, and to install and maintain two telephones at the station. The work was completed on March 24, 1900. It has proved of great value not only to your officer and service here, but it has also been freely and frequently used by officers and employees of the Departments of Marine and Fisheries and Public Works, and by pilots, shipping and newspaper men, contractors and merchants.

During the year extensive repairs have been made to the quarantine officer's residence and a hot water heating apparatus has been placed therein. These improvements and additions have added greatly to the appearance of the building and to the comfort of those who reside there. I congratulate the department on the first named result and sincerely thank them for the second.

Generally, the year has been one of progress here, and I think that its outcome should be accepted as satisfactory. Though continually threatened by grave contagion, none has entered the port. Our opportunity for preparation has been extended and we have fairly availed ourselves of it. Before, however, we can claim to be fully equipped, a water supply, and a wharf to which vessels requiring disinfection may be brought, must be provided. The plan to be followed in securing the first of these has been adopted and will doubtless be carried to a successful issue. The second is still under consideration, but I hope the work begun here will not be allowed to end until a suitable and permanent quarantine wharf has been provided.

With the approval of the St. John Board of Health,—before whom, on invitation, I appeared and explained the character, use and purpose of the Danysz rat virus,—I began a campaign against the rats along the harbour front on Monday, October 22. A second and third baiting of the wharfs and warehouses will be practised, but the rats are so numerous that even though thousands of them should be destroyed, thousands will still remain, and the virus would have to be exhibited again and again before we could hope to rid the water front of them.

Many applications for the virus have been received by me from hotelmen, marketmen, grocers, merchants and residents of the city, but, as the supply sent me is limited, and intended for a specific purpose, I have not felt that I could divert any of it for the benefit of the individual citizen. A further and separate report will be made by me on this experiment.

The special instructions which have been received by me from time to time during the year have been carefully observed.

I have the honour to be, sir,
Your obedient servant,

J. E. MARCH, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 6.

CHATHAM, N.B., October 31, 1900.

SIR,—I have the honour to submit my report for the year ending October 31, 1900.

No disease of a contagious or infectious character was found on any of the vessels inspected at this port during the past season.

The number of vessels inspected since the commencement of the quarantine year was 102.

One steamship, the *Saint Giles*, arrived on October 3, sixteen days out from Glasgow. A thorough inspection of all on board revealed no sign of the terrible plague which at the time of sailing prevailed in the above-mentioned city, and the ship was admitted to pratique without detention.

The boat used in boarding ships is old and unsafe for boarding in rough weather. I most respectfully recommend that a new one be procured for next season.

The quarantine buildings have received a much-needed coat of paint. The work was done by the careful and efficient caretaker, Mr. I. Currie. It was necessary to procure two ladders which were required in painting the buildings, and are absolutely necessary in case of fire breaking out about the premises.

Your instructions *re* Danysz Bouillon were promptly carried out, and the material distributed about the wharfs and warehouses of Chatham.

I have the honour to be, sir,
Your obedient servant,

J. MACDONALD,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 7.

QUARANTINE OFFICE,
CHARLOTTETOWN, P.E.I., October 31, 1900.

SIR,—I have the honour to submit my report for the year ending October 31, 1900.

No grave disease of a contagious character was found to exist on board any vessel arriving at this port during the past year.

The trade in vessels to this port is chiefly from points north of New York.

There were eleven arrivals from transatlantic ports and the West Indies, all of which were duly inspected.

The repairs to the hospital building, which were sanctioned by the Director General of Public Health last year, still remain unattended to.

I have the honour to be, sir,
Your obedient servant,

P. CONROY, M.D.,

The Honourable
The Minister of Agriculture,
Ottawa.

No. 8.

VICTORIA, B.C., October 31, 1900.

SIR,—I have the honour to submit this my report for the year ending October 31, 1900. The past year has been the busiest in the history of William Head station.

This has been due particularly to the presence of plague in ports from which 80 per cent of the vessels coming to British Columbia sail. This disease has been present again in Hong Kong, and has broken out during the past year for the first time in different places in Japan, although there, fortunately, making little headway; in Manila, Sydney, Brisbane and other points in Australia, and nearer at hand in Honolulu and San Francisco. The outbreak in Honolulu, which occurred in December and lasted until March, necessitated the fumigation by sulphur for the destruction of the rats on all vessels which had been at the docks in Honolulu. Some thirteen vessels were so treated. The crews were bathed, and their effects disinfected by steam. These vessels were all sailing ships or tramp steamers.

Before plague had subsided in Honolulu it appeared in Chinatown, in San Francisco, where it still continues, although only a score of cases have been discovered, one every week or so. There is reason, however, to believe that other cases have occurred, but with the peculiar secretiveness of the Chinese, these have been concealed. On the occurrence of the first cases of plague in San Francisco the exemption from medical

inspection of vessels from that port was withdrawn. Having to examine vessels from San Francisco has made the number of vessels now examined nearly double than formerly examined.

During May the exemption from inspection of vessels from Puget Sound was on account of the prevalence of small-pox in the neighbouring states also withdrawn, and medical inspection at railway points on British Columbia boundary line was also instituted. A few weeks afterwards small-pox made its appearance in Alaska and Yukon Territory, and vessels carrying passengers from there were also required to undergo inspection, this work has been done by Dr. Fraser, of Victoria, and Dr. McKechnie, of Vancouver. The disease was carried north by vessels leaving Seattle. From there the disease returned on south-bound steamers, being found on three vessels arriving at Puget Sound, and within the last week on the *City of Seattle*, arriving in Vancouver. A case of small-pox was discovered on her by Dr. McKechnie, quarantine officer at that port, as the passengers filed by him. At the time of writing, passengers and crew of this vessels are in quarantine at William Head. Incidentally I might say that the duties of attendance upon the large number of people now here prevent my compiling as full a report as the work of the past year would properly call for. Vessels which were quarantined during the year on account of small-pox are the *Monmouthshire*, with Chinese and Japanese steerage passengers, and the *Walla Walla*, from San Francisco, with some 250 persons, comprising passengers and crew, all Europeans, and the *City of Seattle*, from Skagway, with some 350 passengers and crew, mostly returning miners. Those vessels had all for their final destination some United States port, and the majority of passengers in every instance were for United States. At the request of the steamship companies, and by wish of the American-bound passengers, they were allowed to pass their period of detention at this station. The owners were thus able to secure release of the vessel, and the passengers necessarily putting up with certain inconveniences here because of the accommodation for saloon passengers only being sufficient for the care of the largest numbers of Canadian-bound passengers likely to be detained, were content to avail themselves of the large dormitories erected for steerage accommodation. Some passengers, however, went into tents by preference. The women and children were given good and sufficient accommodation in the saloon building.

A number of Indians who had been at the hop fields in Washington state were detained under observation, some at William Head and others at different points in the province, as small-pox had occurred amongst the Indian hop-pickers.

A case of small-pox occurred on the *Empress of India* while in Shanghai, nineteen days before arrival here. As proper precautions had been taken there, and all were well on arrival, no detention was enforced. One of the saloon passengers of the *Empress of Japan* was taken ill on the overland train, and died in Winnipeg about ten days after leaving here. The cause of death was not recognized as small-pox until suspicion was aroused by the nurse in attendance and others coming down with the disease a fortnight afterwards. The origin of infection in the case of this passenger is surrounded in mystery, but the infection might have been acquired in Japan before departure. The ss. *Tees*, from Skagway, spent 24 hours in quarantine as a case of illness, suspected to be small-pox, was reported on arrival in Victoria; this suspicion, however, turned out incorrect.

On account of the prevalence of plague, a bacteriological laboratory was established during the spring, Chas. H. Higgins, assistant pathologist of the Department of Agriculture, being sent out from Montreal to establish it. The Haffkein prophylactic fluid is being manufactured here. Professor Adami, of McGill University, pathologist of the Department of Agriculture, inspected the laboratory while on a visit to the coast, and considered it thoroughly equipped. When a new building is erected for the laboratory, it will be possible to arrange the apparatus more conveniently.

During the summer considerable repairs to the wharf were made, the work done being for the purpose of bracing the wharf more thoroughly. A number of the build-

ings at the station were painted, and preparations were made to paint others, but the arrival of small-pox at the station deferred the work.

The ss. *Earl* has not always been available for service, on account of the condition of the boiler, but when the new boiler which has been authorized is put in, she should give satisfactory service, although the weather here is often too rough for a boat of the *Earl's* size and design.

A new steam disinfecting chamber has also been authorized, but the tenders have not yet been called for.

The routine disinfection of steerage passengers from China and Japan has been carried out as in the previous three years. A feature of last season's immigration was the exceptionally large numbers of Japanese who came over. One vessel brought as many as 1,600. The bathing of this number, and the disinfecting of their clothing and baggage, occupied the staff for thirty-six hours at a stretch. Fortunately, the amount of baggage brought by these people is small, or a much longer time would have been occupied. Some twenty-three thousand Chinese and Japanese steerage passengers, and numbers of crews, have been bathed and had their effects disinfected during the past twelve months, nearly two-thirds of this number being Japanese. This is much in excess of last year, when only some ten thousand were so treated.

Arrangements are being made by the American sanitary officials in Hong Kong and Japan for thoroughly disinfecting steerage passengers and effects before departure, and for enforcing, when it seems desirable on account of prevalence of plague, an ante-embarkation detention period of fifteen days. All Japanese passengers are thus now treated, whether bound for Canada or the United States, the various steamship companies having agreed to take the precaution. The Canadian Pacific Railway steamers, however, owing to the prevalence of plague in Japan, have latterly entirely discontinued carrying Japanese passengers.

Chinese passengers on all American-bound vessels are also disinfected in Hong Kong. This is carried out for both American and Canadian passengers.

The number of vessels inspected has been three hundred and sixty.

The diseases treated in the hospital have been small-pox, dysentery, beri-beri and diarrhœa. Two deaths have occurred, one from small-pox, one from diarrhœa.

The station has been visited during the past year by Dr. Montizambert, D.G.P.H., by Dr. Kenyon, of Angel Island Quarantine, California S.M.H.S., by Dr. Foster, P.A.S.M.H.S., quarantine officer at Port Townsend, and by Dr. Fagan, sec. P.B. of H., of British Columbia. These gentlemen expressed themselves pleased with the equipment here.

I have the honour to be, sir,

Your obedient servant,

A. T. WATT, M.D.,
Superintendent British Columbia Quarantine.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 9.

REPORT ON VICTORIA, B.C., QUARANTNE STATION.

(R. L. Fraser, M.D.)

VICTORIA, B.C., November 1, 1900.

SIR,—I herewith submit my report for the Quarantine Station, Victoria, B.C., for the year just ended.

No case of contagious or quarantinable disease arrived here during the year. This is very fortunate, for small-pox has been prevalent to the north and south of us during most of the year.

On May 3, I received instructions from Dr. Montizambert, Director General of Public Health, to inspect all foreign vessels touching here. For nearly two months prior to this date these boats were inspected by the Provincial Board of Health. There are four daily boats from Puget Sound ports, and from two to five weekly boats from Alaska. Many of these steamers arrive here at night, when a satisfactory inspection is difficult to make.

I would respectfully suggest that when vessels are subject to inspection it should be done in daylight.

I have the honour to be, sir,
Your obedient servant,
R. L. FRASER, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 10.

REPORT ON VANCOUVER, B.C., QUARANTINE STATION.

(L. N. MacKechnie, M.D.)

VANCOUVER, B.C., October 31, 1900.

SIR,—I have the honour to submit this my report for the year just ended.

The number of vessels inspected was 223. Only one case of contagious or infectious or quarantinable disease arrived at this port during the year. It was one of small-pox, from Ketchikan, on the ss. *City of Seattle*, which went into quarantine at William's Head October 22. Since May 1, all vessels arriving from Alaska and ports north of San Francisco have been inspected.

Some vessels arriving from Alaska call regularly at Port Simpson and other British Columbia ports. Other vessels call at Oyster Harbour and Union to coal; all of these are properly coastwise vessels, but they also have been inspected.

I have the honour to be, sir,
Your obedient servant,
L. N. MACKECHNIE, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 11.

REPORT ON THE LAZARETTO, TRACADIE, N.B.

(A. C. Smith, M.D.)

TRACADIE, N.B., October 31, 1900.

SIR,—I have the honour to submit this my annual report on the leper hospital at Tracadie, N.B., for the twelve months ending at this date.

There are to-day twenty inmates of the lazaretto, thirteen males and seven females. The ages of these patients, with dates of admission, are respectively as follows:—Nineteen (admitted November, 1899), twenty (March, 1899), twenty-two (April, 1897), twenty-three (November, 1899), thirty (April, 1897), thirty-one (December, 1897), thirty-three (April, 1897), thirty-five (October, 1900), thirty-six (April, 1897), thirty-six (July, 1897), thirty-seven (July, 1878), thirty-seven (August, 1890), forty (October, 1897), fifty-three (October, 1896), fifty-four (April, 1897), fifty-six (July, 1896), fifty-six (October, 1880), fifty-nine (June, 1899,) sixty-one (December, 1897), sixty-four (November, 1897).

Seven of the inmates may be classified as being in the *first*, twelve in the *second*, and one in the *third*, the final, stage of the malady.

There were four deaths during the year, and three new cases were admitted from the surrounding districts. All known cases are now promptly segregated. Formerly when segregation was far from thorough, the disease spread rapidly.

During the months of January and February there was an unusual amount of illness among the inmates. The improved sanitary conditions, and the system of uniform heating at the lazaretto, were valuable aids to the medical treatment of the sick.

The general behaviour has been most satisfactory, and the unfortunate sufferers seem contented and at times surprisingly cheerful. During fine weather many of them spend a large portion of their time outdoors, but no efforts at escape are ever made. The inmates of the lazaretto, although isolated from the world, enjoy all the comforts obtainable, and it is impossible not to observe the kindness and attention shown by the sisters in charge to these afflicted people under their distressing circumstances.

During the year I have received favourable reports on the use of chaulmoogra oil and creolin, in foreign leper hospitals. Several of our less advanced cases have been induced to make a trial of these drugs, and with encouraging results.

As in former years, I have been called on to examine several persons, male and female, unjustly reported leprous, and to give the necessary certificates, thus enabling them to resume employment.

The citizens of the neighbouring republic are awakening to the necessity of a national leper asylum. 'Investigation, which has hitherto moved in a more or less academic orbit, commandeered by pamphleteers, has entered into a definitely practical phase.' This is a matter of interest to the people of Canada.

I have the hour to be, sir,
Your obedient servant,
A. C. SMITH,
Inspecting Physician in Leprosy and Physician to the Tracadie Lazaretto.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 12.

REPORT OF ASSISTANT PATHOLOGIST.

(Chas. H. Higgins, B.S., D.V.S.)

SIR,—I have the honour to transmit this my report as assistant pathologist to the Department of Agriculture, covering the work in connection with the 'bio-chemic' laboratory of the William Head Quarantine Station, from March 28 to October 31, 1900.

Upon receiving my instructions on March 23, I concluded, as far as possible, the work then on hand at the Outremont Experiment Station, leaving for this point upon the 28th, arriving in Victoria on April 2, and at this quarantine station on April 3.

Before leaving Montreal such apparatus as was deemed necessary was ordered through your office, part of which reached me the latter part of April. The remainder followed shortly after.

With the advice and consent of Dr. A. T. Watt, superintendent of British Columbia quarantines, the north wing of the 'Japanese' building was selected for the laboratory till such time when a suitable building could be provided.

After the installation of the apparatus my first work was to familiarize myself with the 'Bacillus Pestis Bubonica,' in order that I might be fully prepared to give a correct diagnosis should a suspected case of bubonic plague reach this station. This work I have found very interesting and instructive, as the germ is so different in its characteristics from any hitherto studied.

DESCRIPTION OF THE PLAGUE BACILLUS.

Morphology.—*Short, thick, straight rods, with rounded ends.

In length it varies from 0:7-1:2 m., and is half as broad They sometimes occur in chains, and have been observed in some cases to have a capsule. In fresh broth cultures they are often seen in chains, resembling streptococci. In old cultures they sometimes completely lose their elongated shape and appear as cocci. The germ takes the polar staining, leaving an unstained central portion. In unstained preparations and in the hanging drop this polar arrangement of the protoplasm is noticed. The form of the bacillus varies greatly according to the media upon which it is grown and also upon its age.

CULTURAL CHARACTERISTICS.

Broth.†—It is upon broth that we get the characteristic growth of the plague germ. Rarely is anything seen on the first day, even with the most virulent culture, but upon the second and third days, provided the flasks containing the inoculated broth are upon a solid bench and free from jarring, there are to be seen stalactite growths in the form of very fine needles. These stalactite growths upon the least jarring of the flask break away from the fat to which they are suspended, sinking to the bottom.

Various preparations of broth have been tried, but the one found best suited to the work is that given in the formula referred to. This germ does not thrive well upon broth to which has been added glycerine, glucose or lactose. The reaction of the

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*The germ described was furnished by Dr. Wyman, of Washington, upon request through your office.

†For the method of preparation see description given in connection with the manufacture of Haffkine's Prophylactic.

media is also a very important point, as a slight amount of acid or alkali will retard or completely destroy its growth. At this laboratory the best growths have been obtained upon media neutral to phenolpthalein, this media giving the strongest Haffkine's in the shortest time.

Gelatin.—Upon gelatin there is nothing characteristic; the growth appearing after the fifth or sixth day as fine granular masses along the entire stab.

Agar.—Upon agar we get a characteristic look to plague cultures, the growth appearing as very pale masses upon the surface after the second day, having a shining, slimy look. These masses upon being teased with a platinum wire, draw out into long sticky threads, and are easily moved about upon the surface of the agar. With a culture that has been grown in the laboratory for some time, even if fresh cultures are made upon the dry surface of agar tubes, we get numerous involution forms, which appear in the stained preparation as brownish masses swollen to such a size as to have completely lost their original shape. Upon agar plates there is little difference in the appearance of the germ from that seen in tubes of the same material.

Blood Serum.—Very slight growths only have been obtained upon the blood serum at hand, as it contained 7 per cent glycerine, being originally put up for the growth of tubercle, and not at all suited to plague work.

INOCULATION DISEASE.

The inoculation disease has been observed only in guinea pigs, they having been the most easily acquired animals.

Symptoms.—A guinea pig inoculated subcutaneously shows at the end of twenty-four hours marked depression, rise in temperature and enlargement of the lymph glands, particularly those of the inguinal region. He refuses food and water, sitting in a corner of the cage motionless, unless forced to move. The respirations are increased, the temperature rises from normal to 104-106° Far., and remains at this point till death supervenes.

Pathological Lesions.—The lesions of plague as seen in the guinea pig are characteristic. We have first the enlargement of all of the external lymph glands. Those of the inguinal region are greatly enlarged and inflamed, much more so than glands in other portions of the body, which is probably due to the fact that they are nearer the point of inoculation. True suppuration has not been observed in any cases. Upon opening the abdominal cavity the spleen is seen to be greatly enlarged, and contains numerous necrosed, tubercular-like masses about the size of a pin head. The liver is enlarged and congested. The gall bladder is greatly distended with bile. The kidneys present little to the naked eye. The lungs at times are affected, and contain small inflamed masses about the size of a small pea. The bacillus pestis is found in all of the tissues and fluids of the body.

Upon microscopical examination we get a cloudy swelling of the spleen, liver, kidneys and other organs. We may have in the lungs, spleen and liver secondary areas of necrosis. The bacilli are found irregularly in the tissues in enormous numbers.

VIRULENCE OF PLAGUE BACILLUS.

This varies greatly according to the media upon which it is grown, and upon the conditions under which it is kept. The weakest germ worked with killed a guinea pig in seven days. The most virulent in fifty-seven hours.

Grown upon ordinary culture media it soon loses its virulence. It has been found that by using capillary tubes much greater success has been obtained, and it has been possible, under favourable conditions, to retain its virulence for a period of three months. How much longer than this it would be possible to keep such culture has not been determined.

HAFFKINE'S PROPHYLACTIC.

Work in connection with this product has been the main feature in connection with the laboratory since its origin. The manufacture of this preparation, while it is very simple, requires great care in preparing the media and in its subsequent treatment. The medium used was beef broth, made in the following manner :—

Liebig's extract of beef.....	5 grams
Witte's peptone.....	10 "
Sodium chloride C.P.....	5 "
Water....	1000 "

After thoroughly boiling, this is neutralized to phenolpthalein, filtered and placed in flasks of suitable size for its manufacture. To each of the flasks sufficient butter fat* is added to allow a thin film over the surface, after which they are sterilized and are ready for inoculation. This inoculation was practised immediately from the affected organ or from a virulent culture; the best results being obtained when the virus was taken direct from the infected organ. These inoculated flasks are placed in an incubator and allowed to remain for a period of three to six weeks as the case may require. They are examined at least every four days, and the crop of germs clinging to the under surface of the fat are shaken down in order that another crop may form. When it is seen that the successive crops are growing smaller and smaller, the flasks are removed from the incubator and held for an hour at 70° C., which kills all of the living germs. While still hot it is drawn off into sterilized bottles, 10 c.c. being placed in each. These bottles are then sealed with a sterilized rubber stopper and immersed in hot parafine to the neck, forming a thin film over the rubber stopper, hermetically sealing it. Great care is essential in this process of bottling, as there is great liability to contamination.

After the fluid has been bottled, a number of these bottles are tested to determine the strength of the toxine, and the amount required to immunize a guinea pig determines the proportionate amount required for man. The method of standardizing is, to say the least, a very crude procedure, and attempts have been made to determine the strength of the toxine by chemical methods, but in this laboratory no success has been obtained by any of the methods tried. Such a method would be better than the one at present practised.

A number of bottles from each flask are also placed in the incubator, where they are allowed to remain for a period of two weeks in order to determine whether there has been a contamination of the product during the bottling, from imperfect sterilizing or accidents.

SYMPTOMS OF HAFFKINE INOCULATION IN GUINEA PIGS.

The symptoms of the Haffkine inoculation in the guinea pig are much the same during the first few days as those of plague, after which the animal gradually recovers, becoming by the process an 'immune,' and will resist infection by contact and by subcutaneous inoculation of virulent cultures. If an exceedingly large amount of virulent culture is injected into an immune guinea pig he succumbs, which is due to the fact that he is unable to withstand the shock and the poisonous effect of the toxine injected with the living bacilli. Under ordinary circumstances he is an 'immune,' and will remain so for a period of three months.

SYMPTOMS OF HAFFKINE INOCULATION IN MAN.

In connection with this inoculation I can only relate my own experiences in this connection, as the conditions existing have not seemed to warrant the inoculation of any of the quarantine staff, nor have any specially desired such inoculation.

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*The butter fat used in connection with my media was prepared by heating a small amount of butter in an autoclave, together with a large amount of water. This was repeated several times, and the stock preparation was kept sterile in a flask to be used as desired.

A few hours after the inoculation there is a feeling of restlessness, slight rise in temperature, glassy look to the eyes, pains in the arms and legs of a mild character. This feeling of restlessness continues, being accompanied by weakness. There is a desire to be moving all the time, but the feeling of exhaustion will not allow such movements. After ten hours the symptoms gradually decrease, and no untoward effects experienced save the swelling and soreness at the point of inoculation. This soreness at the point of inoculation lasted for about ten days, leaving a nodule, which disappeared in two months. The lymphatic glands were slightly enlarged in about eight hours, and remained so for three days.

This vaccination against plague was not as severe in this case as ordinarily follows small-pox vaccination.

Aside from the work upon plague, I have done some experimenting upon beri beri, and examined preparations taken from small-pox patients, but am unable to add anything to what is already known about these diseases.

ACETYLENE GAS FOR LABORATORY USES.

In connection with the report upon the work of this laboratory, I wish to speak of the gas machine in use here. Being situated away from a city gas supply, and not desiring to work with coal oil and gasolene, I installed an acetylene gas machine for all of the uses of this laboratory.

The machine selected was a 'Burnonville,' manufactured by The General Acetylene Company, of New York City. This machine, in mechanical construction, seemed to be best adapted to my uses, at the same time requiring but very little attention. In order to render it possible to use acetylene Bunsen burners, it was necessary to modify the machine in order that a pressure on the gas main sufficient to raise a column of water four inches could be maintained. This was accomplished by modifying the traps. Without this pressure it is impossible to run these burners. The gas main used for lighting and running the incubators had a pressure sufficient to raise a column of water an inch and a half.

This machine has more than fulfilled my expectations, and personally I prefer this gas for general laboratory uses to the ordinary coal gas. With it you are always sure of your pressure, you are independent in your supply and can always have sufficient gas for any purpose. The acetylene light makes the best light I have ever used for microscopical work, giving a clearer definition and bringing out the colours more distinctly. In spite of the high explosive nature of a mixture of this gas with air, I have experienced no trouble, nor do I consider it dangerous to use provided one uses a fair amount of common sense at all times in its manipulation.

I have the honour to be, sir,
Your obedient servant,

CHAS. H. HIGGINS, B.S., D.V.S.,
Assistant Pathologist, Department of Agriculture.

The Honourable
The Minister of Agriculture,
Ottawa.

CATTLE QUARANTINE.

No. 13.

REPORT ON THE CATTLE QUARANTINES IN CANADA, FROM NOVEMBER 1, 1899, TO OCTOBER 31, 1900.

(By Professor Duncan McEachran, F.R.C.V.S., V.S. Edin., D.V.S. McGill, Chief Inspector of Live Stock for Canada.)

Office of the Chief Inspector of Stock,
Montreal, October 31, 1900.

Sir,—I beg to transmit herewith my twenty-fourth annual report on the cattle quarantines of the Dominion.

I have much pleasure in calling your attention to the excellent health and condition of all classes of live stock throughout the entire Dominion. Hog cholera, which, a few years ago, was widespread, especially in the western peninsula of Ontario, has been entirely eradicated from the most infected centres, and may be said to scarcely exist.

Glanders still continues to occur in the North-west Territories and Manitoba, attributed largely to importations of cheap horses from the south. It is at present not known to exist in the older provinces.

Scab in sheep is at present confined to a few farms in the townships of Eldon, Brock and Thorah, in western Ontario, which are under quarantine.

Mange in cattle, which was epizootic in Alberta and part of Assiniboia, North-west Territories, is well under control, and it is confidently believed that by a continuance of the measures adopted for another year it will altogether disappear.

Tuberculosis is rapidly decreasing throughout the Dominion, as will be seen by the fact that out of 17,785 head tested, by request of the owners, only 358 reacted.

I regret to say that this disease has again been discovered in imported cattle. In one case, in a herd which was not tested in quarantine, but at the owner's farm ; in another, in a herd, not tested in quarantine, but tested when entering the United States; also in two herds tested in quarantine by order of the owners.

I have the honour to be, sir,
Your obedient servant,

D. McEACHRAN,
Chief Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

IMPORTATIONS, MARITIME CATTLE QUARANTINES.

	Cattle.	Horses.	Sheep.	Swine.	Mules.
Lévis Cattle Quarantine, Quebec	508	2	1,063	15	
St. John, New Brunswick	117	19	36	9	
Halifax, Nova Scotia					
Charlottetown, P.E.I.		1			
Montreal		196			
	625	218	1,099	24	

Of these 83 cattle, 190 sheep, and 2 swine were for the United States.

IMPORTATIONS FROM THE UNITED STATES AT FOLLOWING PORTS.

	Horses.	Cattle.	Sheep.	Swine.	Mules.
St. John, New Brunswick		2	1		
Niagara, Ontario	1	4	1	32	
Point Edward, Ontario		28		18	
Windsor, Ontario	9	45	1	7	
Emerson, Manitoba	881	82	297	23	14
Gretna, Manitoba	1,077	394	160	156	61
North Portal, Assiniboia	2,627	1,260	73	355	71
Maple Creek, Assiniboia	1,110	7			
Lethbridge and Coutts, Alberta	279	34			
Macleod, Alberta	106	94	2		
Nelson, B.C	94	44	6,543	5	
Rossland and Trail, B.C.	26	1		143	2
Grand Forks, B.C.	150	54	316	197	
Victoria, B.C.	61	4	155	30	
	6,421	1,963	7,549	966	148

It will thus be observed that, as compared with the preceding year, there has been an increase in importations of European pure-bred stock of 377 cattle, 342 sheep, 15 swine, and 190 horses.

At the Point Lévis cattle quarantine there were sixteen calves born, and two calves, one cow and two sheep died there.

On an understanding with the Bureau of Animal Industry, and by request of the owners, thirty-one head of cattle, intended for the United States, were tested in quarantine ; twelve of them re-acted, and are, at the desire of the owner, still in quarantine. The calves born there will be removed and fed by tested foster mothers (Bang's system), and may thus be saved.

Of another herd which was not tested in quarantine, two re-acted when tested on entering the United States and were prohibited entry.

These and similar cases, together with Dr. Salmon's statement, that 'it is alleged that parties who are to bring cattle into the United States intend to avoid our quarantine and bring them by way of Canada, so that the animals will not be necessarily tested after their landing in America,' and that 'if the importers are afraid to have their cattle tested in the quarantine station, that is an evidence that they have no confidence in their being free from disease,' have, unfortunately for Canadian breeders of pure-bred stock, led to the following regulations being substituted for previously

existing ones, by which charts of testing by any veterinarian authorized to test by the Minister of Agriculture were accepted at United States ports of entry :—

(B. A. I. Order No. 79.)

REGULATIONS FOR THE INSPECTION AND QUARANTINE OF HORSES, CATTLE, SHEEP AND OTHER RUMINANTS, AND SWINE IMPORTED INTO THE UNITED STATES.

(Amendment to B. A. I. Order No. 56.)

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
WASHINGTON, D.C., November 10, 1900.

It is hereby ordered, That rule 5 of the regulations for the inspection and quarantine of horses, cattle, sheep and other ruminants, and swine, issued under date of December 28, 1899, B. A. I. Order No. 56, be and is hereby amended to read as follows : All cattle over six months old imported into the United States after December 1, 1900, which are subject to quarantine, and except as otherwise provided, shall be tested with tuberculin by an inspector of this department, stationed in Great Britain, or after arrival at the animal quarantine station. All cattle so tested and which show a reaction shall be prohibited from entry into the United States or be disposed of as provided in section 10 of above regulations.

For cattle imported by way of Canada, certificate of tuberculin tests made by the Canadian superintendent of quarantine during the period of detention will be accepted.

It is further ordered, That rule 6 (paragraph *c*) be and is hereby amended as follows : All milch cows, and cattle over six months old, for breeding purposes, shall be tested with tuberculin by an inspector of this department, and all cattle so tested which show a reaction shall be prohibited from entry into the United States.

JAMES WILSON,
Secretary.

Those desiring animals tested abroad should address Dr. Tooie A. Geddes, care of U. S. Consul General's Office, London. Those desiring cattle tested in Canada should address Dr. E. L. Volgenau, Live Stock Exchange Building, East Buffalo, N.Y.

Permits as required by rule 9 of B. A. I. Order No. 56 for cattle and other animals must be obtained as heretofore.

It is to be hoped, however, that the matter may be reconsidered and some understanding adopted whereby Canadian charts of tests will be accepted even if they are to be granted only by a few specially qualified men in whom implicit confidence can be placed.

EXPORTATION FROM MANITOBA AND THE NORTH-WEST TERRITORIES.

In compliance with a request, I have been furnished by the general freight traffic manager of the Canadian Pacific Railway with the following statement of cattle carried by them from Manitoba and the Territories to Montreal for shipment, for twelve months ending October 31, 1900:—

	Cattle.	Sheep.	Horses.	Swine.
Manitoba..	5,490	300	....	....
North-west.	43,863	1,379	50	....

This is an increase of 18,695 cattle, 1,486 sheep, 25 horses, with a decrease of six swine.

It does not include the army horses for South Africa.

EXPORTATION OF LIVE STOCK FROM MARITIME PORTS.

Table showing numbers shipped during past five years.

—	Cattle.	Sheep.	Horses.	Swine.	Dogs.
1896	101,502	117,428	11,531		
1897	117,428	62,406	10,651		
1898	111,948	47,050	7,057		
1899	97,014	62,308	4,980	174	
1900	103,511	7,734	3,597	63	2

The horses from South Africa were not inspected by your inspectors, and are not included in the above statement.

SHIPMENTS FROM EACH PORT.

—		Cattle.	Horses.	Sheep.	Swine.	Dogs.
Montreal		87,287	2,997	2,683		
St. John		15,471	485	2,911		
Charlottetown	United States			240		
	West Indies	5	24	22		
	Newfoundland	703	56	2,249	63	
Halifax	Great Britain		6			2
	Jamaica	3	5	62		
	Bermudas	23	18	74		
	West Indies	77	4	91		
	Newfoundland	12	2	2		
Total		103,511	3,597	7,734	63	2

Table showing number from United States in above :—

	Number.
Cattle	9,083
Horses	72
Sheep	2,398

It will thus be seen that there is an increase of 6,497 cattle, and a decrease of 1,383 horses, 54,574 sheep and 111 swine as compared with last year.

The number of animals rejected by your officers as being unfit for shipment is gratifyingly small : 106 cattle, of which nine were rejected for actinomysis, the balance from injuries in transit, most of them in a railroad collision. Owing to the action of the Montreal civic authorities in condemning all cases of actinomycosis, the number brought to this port during the shipping season is greatly reduced. Thirty-one sheep were rejected for lameness, and forty-seven horses were rejected, forty-three for influenza and four for strangles.

It is gratifying to know that the results of using better bred bulls are becoming apparent in the improvement of the cattle exported ; this is particularly noticeable in

those from the western herds. Now the breeders have started on proper lines of breeding, the improvement will become more and more marked as the years go by.

The placing of Ontario-bred shorthorns on the Alberta ranges still continues actively ; large numbers of Ontario and Manitoba stockers have also been placed on the ranges during the past season.

The cattle trade of the country, on the whole, may be said to be prosperous, and breeders and feeders are following greatly improved methods in their business.

By reference to the reports of the inspectors from all parts of the Dominion, it will be seen that the health of live stock is all that could be desired or expected; no other cattle-raising country in the world can show such a clean bill of health or such freedom from contagious, or even ordinary, diseases of animals. The climate, soil, food and water throughout the Dominion are such that all farm animals with ordinary care do well.

I have much pleasure in reporting that the duties of inspection were satisfactorily performed at the maritime ports, at Montreal by Doctors Baker, D.V.S., C. McEachran, D.V.S., and B. A. Sugden, D.V.S.; at Quebec by Dr. J. A. Couture, D.V.S.; at St. John by Dr. Frink, V.S.; at Halifax by Dr. William Jakeman, D.V.S; at Charlottetown, P.E.I., by Dr. A. A. Leckie, M.R.C.V.S. Reports from these gentlemen you have already received.

TUBERCULOSIS.

STATEMENT showing number of cattle tested in each province during twelve months ending October 31:—

Province.	Number Tested.	Number Reacted.
Ontario	13,089	200
Quebec	1,210	27
New Brunswick	1,439	29
Nova Scotia	275	10
Prince Edward Island	343	4
Manitoba	1,198	77
North-west Territories	15	....
British Columbia	216	11
Total	17,785	358

Bearing in mind that the testing is voluntary on the part of the owners, and that most of the herds tested are suspected, the remarkably low percentage of re-actions indicates that this veritable plague exists to only a limited extent. And considering that a large proportion of these animals which react would, if fattened and slaughtered, be found, on examination, to be quite fit for food, the total loss would be very small even if all were killed off, and would be insignificant compared with the benefits which would ensue to our live stock industry and public health.

It is by no means necessary, however, to kill off immediately all racting animals; as a matter of fact, in the case of valuable, highly-bred stock, it would be an unnecessary waste to do so.

BANG'S SYSTEM OF BREEDING FROM TUBERCULOUS STOCK.

Having recently paid a visit to Denmark,* during which I had the privilege of spending a few days with Professor Bang, and acquiring a full insight into his methods of dealing with this disease, I longed for a favourable opportunity of putting my information to a practical test in Canada.

This opportunity occurred within a few months of my return home. It appeared that Mr. W. C. Edwards, M.P., of Rockland, Ontario, who was the possessor of one of the largest and most valuable shorthorn herds in Canada, had consulted you with reference to the discovery by him of tuberculosis in his herd. Having sold a bull calf for export to the United States, the United States regulations necessitated that it should be tested before being admitted to that country. This was done and the test showed that it was diseased. Mr. Edwards decided on having his whole herd tested, with the result that 36 cows and heifers reacted, a very large number of high-priced shorthorns which he looked upon as sacrificed, entailing not only a considerable money loss but the derangement of his whole breeding operations.

At your request I visited Mr. Edwards' farm to advise him what was best to do under the circumstances.

Happily I found Mr. Edwards very willing to carry out my suggestion, and with commendable public spirit willingly accepted my advice to give Bang's system a fair trial, thus at his sole expense giving a valuable object lesson to all breeders of pure bred stock in the Dominion, as to what is possible in dealing with tuberculosis in valuable herds.

On returning to Montreal I addressed the following communication to Mr. Edwards the suggestions in which he at once assured me would be carried out to the letter. This was done, Dr. Higginson, V.S., who was appointed to carry out the details, coming to Montreal to be instructed in the details of testing, &c.

'MONTREAL, June 29, 1898.

'DEAR SIR,—I would suggest that in dealing with your cattle with a view to carrying out Professor Bang's system, by far the best plan is to remove every reacting animal, young and old, to an isolated farm which will be all the better if several miles away from your main farm buildings.

'As none of them at present show any clinical symptoms they can be bred from and their calves if removed as soon as born and nursed by tested cows in a building, say the home farm buildings, which have been thoroughly disinfected, or better still in a new building, which you propose to erect in rear of the main byres, the greatest care being exercised in preventing the cow licking her calf, or its sucking the mother. These calves are to be tested with tuberculin when six weeks old, and any reacting must be killed. They will be tested every six months, thus making sure that no tuberculous ones remain amongst them.

'By this means you can preserve the improved blood and raise a healthy herd from the diseased cows. These cows should be kept in the best of hygienic surroundings—and kept out of doors as much as possible—any of them developing clinical symptoms should be destroyed. I would suggest as an experiment that a few common calves from healthy cows (both cow and calf having been tested) be put on to suckle the diseased cows and cohabit with them to prove the communicability of the disease by this means and a few similar calves be kept in a non-infected building perfectly isolated and fed on milk drawn from the diseased cows, both sets of calves being tested every three months : any reacting being killed and a careful post mortem examination being made.

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* See report of visit to Europe, 1897-98.

'The breeding of the non-reacting portion of the herd can thus go on with every confidence, the testing being repeated every three months, and any reacting cattle removed to the diseased herd. The byre should be disinfected on every occasion a reaction takes place. By this means as I explained to you your business of breeding and selling can go on undisturbed ; the diseased ones having been removed and being miles away from your healthy herd.

'I have considered your proposition to divide the large home byre by a close board partition into two (1 and 2) to keep the healthy animals in No. 1 and the diseased animals in No. 2. While it would be quite possible to carry out Bang's system by this means, I would strongly urge the advantages of removing them to a separate farm as above indicated. Buyers would certainly have more confidence in the freedom from disease if there was absolutely no disease on the premises or diseased cattle on the farm.

'Should the diseased cattle have more milk than can be used by the experiment calves, it may be made use of for feeding purposes for calves or pigs without risk of infection if it is raised to 180° F.

'This temperature will kill the bacteria, without giving a taste to the milk or interfering with its usefulness for butter and cheese making, such as occurs when it is boiled. This sterilization will require special apparatus and experienced management.

'In the event of your deciding to kill any of the reacting cattle—on making a post mortem examination if the disease is found to be limited and local—the flesh is considered fit for food, but it should be thoroughly cooked before being eaten ; if it is general in the cavities of the belly and chest the flesh should be condemned.

'There are four conditions that are known to be specially infective and animals showing clinical symptoms of these conditions should not be kept in the herd on any account, but should be destroyed and no use made of them :

'*a*, When the lungs are specially affected; *b*, when the udder is diseased; *c*, when there is diarrhœa, indicating disease of the intestines; *d*, when there is tuberculosis of the uterus. No cattle should be brought into the herd without being tested and found free from disease. Disinfection cannot be too thoroughly done. Every board, joint, corner or crack or crevice should be thoroughly exposed to steam which you can easily arrange ; then with a spraying pump, a solution of commercial carbolic acid, a pint to two gallons of water, should be thoroughly sprayed on to the divisions, floors, feed-boxes, walls and ceilings, and the loose boxes whitewashed to a height of eight feet from the floor.

'VENTILATION.

'I would suggest that the ventilating shafts be enlarged and divided as I explained to you verbally and as indicated by the following rough diagram, the division boards coming only to within three or four feet from the ceiling—with a regulating shutter. It may be divided into two or four shafts, if four, they should be placed at the points of the compass. I will see that Mr. Higginson is well instructed in all the details of testing and carrying out the suggestions made above—and in recording regularly symptoms, temperature and reactions, also observations as to the effect of exposure to infecting media. I may say that being a firm believer in Bang, I feel satisfied that you can rid your valuable herd entirely of the disease with but little sacrifice, owing to their being useful for breeding from ; a position once attained with a herd of such excellence in individual merits and breeding, will enable you to command a market in the United States or Canada far beyond your ability to supply, while others who are indifferent about it will find it difficult to sell animals which cannot be guaranteed free from tuberculosis, or evidence produced by their having stood the tuberculin test.

'Yours very truly,
'DUNCAN McEACHRAN,
'Chief Inspector.'

The following is Dr. Higginson's report to which is appended individual details of each animal.

This report was submitted to the Select Standing Committee of the House of Commons on Agriculture and Colonization during the past session of parliament. It will repay careful consideration by livestock breeders.

ROCKLAND, June 9.

'I have the honour to report to you as follows regarding the experiments carried on by me under the direction of Dr. D. McEachran, Dominion inspector, with cattle affected by tuberculosis on the farm of W. C. Edwards & Co., Ltd., Rockland, Ont.

'In the spring of 1898, it was discovered for the first time that tuberculosis prevailed to a considerable extent in the above named herd, while at the same time the entire herd presented a robust, vigorous and healthy appearance and no outward symptoms prevailed whatever which would lead to the slightest suspicion that tuberculosis was prevalent in the herd.

'On accepting the appointment made by you to carry out certain experiments, and on receiving my instructions from Dr. McEachran, I proceeded as directed by him as follows :—Every animal in the herd was subjected to the tuberculin test and all animals which reacted under the test were separated distinctly from the animals which did not react, and since that date the two herds have been kept as positively and distinctly separated as if they had been many miles apart. The stables and premises in which the herd had been kept previous to the discovery of the disease were most carefully cleaned and thoroughly disinfected as directed by Dr. McEachran, with the use of carbolic acid, sulphur and creoline, and all were carefully whitewashed. A new stable and sheds were erected at some distance away in which to house the portion of the herd which was found diseased, and in summer the two herds have been kept in separate and distinct pastures far removed, so that there has been no contact whatever since the first separation was made. In the spring or early summer of 1898 both stables and sheds on the farm were carefully cleaned and thoroughly whitewashed, and I understand the same is to be now done again in a few days, and is to be an annual process each summer hereafter on this farm. In the season 1898-99 twelve calves were dropped from the cows of the diseased herd, three of which were lost within a few days of their birth, which loss I attribute to the immediate change to nurse cows without having any milk from their dams. Of the nine calves successfully raised, five were raised on nurse cows and four were raised upon their own mother's milk, which was sterilized before being fed to them.'*

'In May, 1899, I again tested the entire herd, including the nine calves so raised, with the following result :—The nine calves here named, four of which were heifers and five of which were bulls, all passed the test most satisfactorily, but in this test three of the cows which passed the test the previous spring reacted, and seven of the cows in the diseased herd did not react in this test. In the spring of 1899, I took a calf from an outside healthy cow, which cow I tested, but which did not belong to or have any connection with this herd, and I had it raised on the milk of one of the diseased cows, the milk being in its natural condition as taken from the cow. I also raised two late calves from diseased cows on pasture, allowing them to run with their dams the entire summer. In October I tested the three calves above stated, and all passed the test satisfactorily. In the same month before beginning to stable the cattle I again tested the healthy herd, all passing the test satisfactorily.'

'I will now deal with the results for the season of 1899-1900. Eighteen calves were dropped from cows which had responded to the test. This season one calf only was lost and none were raised upon sterilized milk. Six of these calves were raised

*That is very likely to be the case because the new-born calf requires the colostrum contained in the first milk to clear out the meconium from the intestines, so it is quite likely Dr. Higginson's explanation is the true one.

upon their own dam's milk, but never entered the premises in which their dams were housed, but were kept in entirely separate quarters and sucked their mothers in the open yard, not being allowed together longer than just a sufficient time for the calves to suck. Eleven calves from diseased dams were raised on nurse cows, in each case the calf sucking its own dam once before being transferred to the nurse cow.

'This spring I again carefully tested the entire herd with the following results :— In the healthy herd, including in its number the four heifers which were raised the previous year from diseased cows, all passed the test most satisfactorily. Of the six calves raised on their own dams as described, five passed the test and only one responded. Of the eleven calves raised upon nurse cows as described, ten passed the test and one only responded. In this test eleven cows in the diseased herd showed no reaction. In this eleven were included five which showed reaction in the spring of 1898, and were included in the seven which showed no reaction in the spring of 1899. The remaining two of this seven were slaughtered.

'Since the time I took official charge of this herd, all animals slaughtered from the herd were slaughtered under my supervision and inspection. In November, 1898, twenty-two animals were slaughtered. Of this number I condemned four as unfit for food. In the eighteen animals whose beef I found perfectly good for food, slight traces of the disease were found in the lungs, and in some instances in other internal parts, but in each instance the beef was perfectly sound and good. In April, 1899, I had slaughtered one cow whose carcass I found perfectly sound and good, but found slight traces of the disease in the lungs. In June of the same year I had another cow slaughtered whose beef I condemned as unfit for food. In December, 1899, I had two cows slaughtered whose beef I found sound and good. In one case, however, I found slight traces of the disease in the lungs, but in the other case I could find no trace whatever of the disease. In April, 1900, I had another cow slaughtered whose beef was sound and good, but I found slight traces of the disease in each of the lungs and liver. Again, in May of the present season two cows were slaughtered, in neither of which any signs of the disease were perceptible to the naked eye. One of these cows and the one killed in December, 1899, which showed no trace whatever of the disease were included in the seven which were among those which reacted in the spring of 1898, but which showed no reaction in 1899.

'The foregoing gives as briefly as I can put it the result of the experiments which have taken place, and the results from slaughter from this herd since my appointment by you in the spring of 1898, and if you will allow me I will give you the deductions which I personally draw from the experiments which have taken place. First, there is now no doubt whatever in my mind but that with reasonable care tuberculosis can be eradicated from any herd, and it is not at all necessary or desirable to slaughter valuable breeding animals. Nor do I consider it essentially necessary that the large expense W. C. Edwards & Co. have gone to need be gone to to the full by others in their desire to profit by the satisfactory and valuable experiments that have been carried out on their farm. Reasonable separation I consider desirable, and good drainage, good ventilation, and plenty of sunlight, as well as general cleanliness, I consider essential in preventing or eradicating the disease. Housing cattle too closely together in dark, unwholesome and ill-ventilated stables in my mind has done more to promote this disease than any other cause. That sound calves can be successfully raised from both diseased dams and sires is fully established by the experiments that have taken place here, for I may here state, that one of the three stock bulls kept on this farm is diseased and his calves come out as successfully as those of the sound bulls. Further, from the experiments which have taken place here it is clear to my mind that, while there is unquestionably danger in calves being nursed by their own dams who are diseased, this danger I, however, think exists more particularly in case of diseased udders, uterus or intestines, and in cases where the cow suffers from generalized tuberculosis ; but I think it possible that many tuberculous cows may suckle

their calves if reasonable precautions are taken as was done in the experiment subsequently described. I would not, however, recommend this practice, it is attended by too much risk. That the disease can be cured I am unable to say ; the experiments which have taken place here do not warrant me in expressing an opinion. I am, however, firmly convinced that under such conditions of ventilation and proper housing as I have described, with separation, the disease can be checked, and in a reasonable time totally eradicated.

'I will simply add this, that the general condition of the stock on this farm, so far as all external appearances would indicate, has been of the very best, since my experiments began; that without the tuberculin test no discovery of the disease could have been made, and, while the test may not always be infallible, all that has transpired here to my mind most strongly recommends its usefulness where honestly applied as a great means of discovering and promoting the eradication of tuberculosis. All of which is respectfully submitted.

'I have the honour to be, sir,
'Your most obedient servant,

'GEO. W. HIGGINSON,
'Veterinary Surgeon.'

DETAILS respecting each animal which calved seasons 1898, 1899 and 1900, and their produce, in matter of experiments with tuberculosis, on farm of W. C. Edwards & Co., Limited, Rockland, Ont.

1898.

No. 1, Lady Lancaster.—Bull calf by diseased sire; sold when twelve months old. Twice tested.

No. 2, Madge Hamilton ; No. 3, Bonny.—Both had bull calves by diseased sire. Were twice tested, and were sold at about eleven months old.

No. 4, Grand Duchess.—Bull calf by sound sire. Tested twice, and sold at about five months old.

No. 5, Lady Augusta. Heifer calf by sound sire. Twice tested as a calf and then tested as a yearling. Nos. 1, 21, 31, 4 and 5 all suckled a nurse cow.

No. 6, Sittyton Verona.—Heifer calf by sound sire.

No. 7, Geanie Girl.—Heifer calf by diseased sire.

No. 8, Pine Grove Clipper.—Heifer calf by diseased sire. Nos. 6, 7 and 8 were raised on sterilized milk. Tested twice as calves and again as yearlings.

No. 9, Louise.—Heifer calf by sound sire. Twice tested as a calf and also as a yearling. Fed on sterilized milk.

No. 10, March Violet.—Bull calf by sound sire. Died when three days old. Cause of death due to change of milk.

No. 11, Darling.—Bull calf got by sound sire. Died about three days old. Cause of death due to change of milk.

No. 12, Mary Leslie.—Heifer calf by diseased sire. Calf a little premature and died about two days old.

No. 13, Minonette ; No. 14, Annie Leslie.—These calves were got by unknown sires and suckled dams on pasture. Tested once at about five months old and were sold to butcher.

1899-1900.

No. 1, Lady Lancaster.—Heifer calf got by sound sire. Calved in September, 1899. Dam reacted in both tests.

No. 2, Madge Hamilton.—Heifer calf by sound sire. Calved in October, 1899. Dam reacted in both tests. Both these calves (Nos. 1 and 2) were suckled by nurse cows.

No. 3, Bonny.—Died. Cast in ditch.

No. 4, Grand Duchess.—Bull calf, sired by sound sire. Calved in September, 1899. Suckled dam. Dam showed no reaction in two last tests.

No. 5, Lady Augusta.—Calf died.—Dam stood first test, but reacted in second.

No. 6, Sittyton Verona.—Not calved yet ; reacted in both tests.

No. 7, Geanie Girl.—Bull calf by sound sire. Suckled by dam ; calved in September, 1899 ; dam reacted in both tests.

No. 8, Pine Grove Clipper.—Heifer calf by sound sire; suckled by nurse cow. Dam stood the first test, but reacted in second ; calved in November, 1899.

No. 9, Louise.—Was slaughtered.

No. 10, March Violet.—Heifer calf by sound sire ; suckled dam ; calved in September, 1899. Calf reacted in test. The dam reacted in both tests.

No. 11, Darling.—Bull calf by diseased sire ; suckled dam ; calved in October, 1899. Dam stood first test.

No. 12, Mary Leslie.—Bull calf sired by diseased sire ; calved in September, 1899; suckled nurse cow. Dam reacted in both tests.

No. 13, Minonette.—Not bred last year. Stood first test.

No. 14, Annie Leslie.—Aborted. Dam reacted in both tests.

No. 15, Mildred Sixth.—Bull calf by diseased sire. Dam stood both tests. Calved in March.

No. 16, Amelia Leslie.—Heifer calf by sound sire ; suckled dam. Dam reacted in first test, but stood second ; calved in September, 1899.

No. 17, Canadian Rosebud.—Bull calf by sound sire ; suckled nurse cow. Dam reacted in both tests ; calved in September, 1899.

No. 18, Mildred Ninth.—Heifer calf by sound sire. Dam stood both tests ; calved in October, 1899.

No. 19, Violet Second.—Bull calf by sound sire ; suckled dam three times, and then was put on nurse cow ; reacted in test. Dam reacted in both tests ; calved in February, 1900.

No. 20, Canadian Rosebud Second.—Bull calf by sound sire; suckled nurse cow ; calved in February, 1900. Dam reacted in first test, but stood second.

No. 21, Lady Lansdowne.—Bull calf got by diseased sire; suckled by nurse cow; calved in February, 1900. Dam reacted in both tests.

No. 22, Rose of Autumn.—Heifer calf got by dieased sire ; suckled nurse cow ; dam reacted in both tests ; calved in May, 1900.

No. 23, Rose Bloom.—Heifer calf by diseased sire ; died in changing to nurse cow ; dam stood both tests.

G. W. HIGGINSON.

THE TUBERCULIN TEST.

Wishing to obtain the views of Mr. Edwards and others on the tuberculin test, I addressed letters to several whose opinions I considered valuable, asking a few pertinent questions, to which I received replies as follows :—

Mr. Edwards' Letter.

DEAR SIR,—I have seen nothing to lead me to believe that the tuberculin test has had any injurious influence on the course of the disease. It is by no means our opinion that the disease has been stimulated or aggravated by the application of the tuberculin test. All animals that we have tested two or three times continue as hale and hearty as they were previously, and not one animal in our herds has broken down or failed in any way since we began testing. I cannot say that we have proof that can be relied upon to the effect that the use of tuberculin has checked the disease, but we will not be surprised if we find that in some instances it does. We retested twelve months later all the animals which at first reacted, and of the lot four made no response in the second test. One of the four animals was slaughtered this autumn and on the most careful examination made with the naked eye no trace of the disease could be found. We believe all the same that the disease was there. Since beginning the experiments here we have raised calves on nurse cows, and on sterilized milk, and not one of the calves so raised has responded in the slightest degree to the test; and all have been carefully tested. We have now gone so far as to turn grade calves on to the diseased cows in pasture, and we also raised a grade calf on the milk of a diseased cow with the pail; each of those that sucked the diseased cow in pasture was tested, as well as the one fed from the pail, and none of them responded whatever to the test. We have learned a good deal from those experiments, and when we are through you will be able to give Canada most valuable information on this subject. Meantime we will be glad if you will treat the whole matter confidentially. We do not think that the test is infallible, but we think it the safest present guide, and we are fully convinced that the honest use of it and a little care should stamp out tuberculosis anywhere. Close contact in confined and ill-lighted and ill-ventilated stables we are convinced is the great means of conveyance of the disease. We are now raising six fine bred calves on the dams, though they are entirely separated and only come together twice a day in open yards. Our belief is that this will prove a success We are well convinced that the disease can be stamped out in Canada and the Canadians will act foolishly if they do not do it.

Yours truly,

W. C. EDWARDS.

It will be noticed that Mr. Edwards has gone so far as to venture and succeed in raising healthy calves on milk of diseased cows. This must not be accepted as a precedent, nor must it be expected to be always successful :—true, calves or persons may for a time without becoming tuberculous use milk from tuberculous cows in which no udder infection exists, yet no one can tell when an animal which is non-infective may become virulently so by invasion of the udder by the disease. This practice should never be followed.

Mr. Edwards' experience, however, goes to demonstrate the harmlessness of the tuberculin test, and that it neither produces the disease nor stimulates it when it exists.

Dr. A. E. Moore, D.V.S., who is specially employed by the department for the purpose of testing cattle, replied as follows:—

DEAR DR. MCEACHRAN,—I beg to say in answer to the first question in your letter of January 11, 1900 : "Does the application of the tuberculin test in cattle have any injurious influence on the subsequent course of the disease ?"

My experience has been that it does not accelerate the disease. In the post mortem on the herd which I will call No. 1, of the slaughtering of which I inclose a detailed report, you will notice that while every one was found diseased on post mortem examination, only three out of twenty-two head which were tested 11 months ago, all of which reacted, were unfit for food. In the remaining number the disease was found encysted. The owner tells me he could see no difference in the health of the animals after they were tested; all thrived well.

In another instance, herd No. 2, some thirty head, were kept over a year after they had been tested; they continued milking just the same, made just as much butter as before the test ; on killing them a year after, all were found diseased, but only a few had generalized tuberculosis.

In answer to your second question : "Has it any beneficial influence on these ?" I am inclined to believe that there are cases where tuberculin has had a beneficial effect. In cow No. 11, in the report on herd No. 1, there was a reaction of $2\frac{3}{5}$ degrees a year ago ; there was no reaction this year at all, although I gave her a very large dose of tuberculin. On post mortem examination the disease seemed perfectly cut off from the healthy part by a strong fibrous cyst, and I am of the opinion that the contents of these encysted cavities would prove harmless even if free in the system, as they were unusually hard and calcarious. There were three other cows which reacted last year, and failed to react this time, but as the owner was not quite ready to kill them, I will report later. I have seen no evidence of new foci being started by the tuberculin test. I have tested, I suppose, nearly 10,000 animals, and I have never had even an abscess form at the point of injection. Even distant lesions do not seem to be affected, as I have killed many animals the next day after testing, and can see no difference in these lesions, no matter how slight they may be. The only thing I have noticed is, that there is more serum or odema at the point of inoculation in an animal that is diseased than one that is not.

Yours truly,

(Signed) A. E. MOORE, D.V.S.,
Inspector.

The following notes on the preparation of tuberculin were handed me by Prof. J. G. Adami, bacteriologist for the department, and are particularly instructive.

The mode of preparation of Koch's T. R. tuberculin is totally unlike that of the ordinary tuberculin such as is used for diagnostic purposes. The latter is a preparation of the glycerinated broth in which the tubercle bacilli have been grown. During the course of that growth the toxines or bacterial products gradually diffuse out of the bacteria, and the tuberculin consists of this fluid of growth from which the bacteria had been filtered off, and which has been concentrated down to one-tenth of the bulk until it contains from forty to fifty per cent of glycerine and to which further one per cent carbolic acid has been added. The process of boiling and evaporating down in itself would destroy any tubercle bacilli which may escape through the filter. The presence of so large a percentage of glycerine absolutely arrests and destroys bacterial growth of any kind. As an additional precaution the presence of the carbolic renders it absolutely aseptic.

Tuberculin R., or as it is more frequently spoken of, tuberculin T. R., is prepared in a totally different manner. It has been found by some observers that whereas some toxines and bacterial products diffuse out, others, and these frequently more potent, remain connected with the bodies of the different bacteria. Thus there are certain very active products which are intra-corporeal in the tubercle bacilli.

To obtain these active toxines is difficult, and the method employed by Koch has been to take very large quantities of young cultures, filter off all the product of growth, dry in vaccuo and rub up with fine sand in a mortar ; express and treat with distilled water, and to continue this process until all the bodies of the bacteria have been

broken up, then this watery solution save the first is centrifugalised repeatedly. The centrifugalisation is repeated until at last no residue remains; this forms the tuberculin T. R.

This contains certain substances which are, according to Koch, insoluble in glycerine, and the reaction given is of a very much milder type ; there is not the same fever, but the immunising power, according to Koch, is more powerful.

It will be seen from this abbreviated description of the process of manufacture that the same safeguards of sterilisation are not carried out in this T. R. as with the ordinary tuberculin. What is more, even after repeated centrifugalisation, it is difficult to remove all tubercle bacilli from being in suspension, while further, it is extremely difficult to so press and bruise these bacilli that every one is killed and broken up. What Trudeau and Baldwin were the first to show, is, that when this tuberculin T. R. is prepared commercially, as a matter of fact in a certain number of samples, the tubercle bacilli are to be found upon careful centrifugalisation, and they went further and showed than when inoculated into susceptible animals, like guinea pigs, in a certain proportion of cases actual tubercles might develop at the point of inoculation and thus the animals become infected.

These observations of Trudeau and Baldwin have since been confirmed by several independent observers with the result that this tuberculin thus prepared has dropped out of use. But in any case it may be added, that the fact that 10 mm. of the dried culture of the bacilli are requisite to produce 1 cc. of this substance and the prolonged process of preparation have from the first rendered this substance altogether too expensive to be used upon cattle. Indeed, the fact already noted that this causes practically no rise in temperature (the most being one-half a degree Farh.) renders this absolutely useless for purposes of diagnosis either in cattle or in man.

The following letter from Dr. E. L. Trudeau, in charge of the sanitarium for consumptives at Saranac Lake, in reply to a letter from me, will be valuable in giving the highest testimony to the harmless character of tuberculin.

SARANAC LAKE, N.Y., December 21, 1899.

Dr. D. MCEACHRAN,
Montreal, Canada.

DEAR DOCTOR,—Yours in regard to my having found living tubercle bacilli in Koch's T. R. tuberculin is at hand. Your position is perfectly correct in the matter, and the criticism of the gentleman who claims that tuberculosis in cattle can be caused by Koch's test tuberculin is entirely due to his want of knowledge of the subject. Koch's test tuberculin, which is used for cattle, is, as you well know, and as he ought to know, absolutely free from any germ life, for two very good reasons. First of all, its manufacture requires long hours of boiling, or of a temperature nearly equivalent to it, which would destroy many times over the most resistant bacteria known. Secondly, it is filtered through porcelain, which would prevent its containing any bacteria even if no heat at all had been used. T. R. tuberculin, on the other hand, is, as you know, a very much later production of Dr. Koch's. It is never used to test either cattle or human beings for tuberculosis, but represents an attempt at immunizing human beings against the disease. It is manufactured entirely without heat and without chemicals from virulent cultures of living tubercle bacilli which are supposed to be crushed beforehand by hours of rubbing in a mortar or some other device. Unfortunately it is impossible to crush all the bacilli by any means as yet used for this purpose, so that as soon as a solution of the body substance of the bacillus has been made, the only guarantee against this solution's holding in suspension living tubercle bacilli is obtained by centrifugating the suspension and pipetting off the supernatent fluid. It soon becomes apparent to one familiar with laboratory methods that if the pipette is inserted a little too far down, or if as the centrifugation causes a little swirl from the bottom to rise from the fluid, one is in danger of pipetting off living

tubercle bacilli which have risen from the bottom, and no adequate protection against this error in technique has been proposed by Dr. Koch in his paper.

As soon as I began the manufacture of this substance it became apparent to me that this was a real danger, and the paper which D. Baldwin and I wrote, and which is referred to by the gentleman you speak of, shows that Koch's T. R. tuberculin, as originally put upon the market, did contain occasional living tubercle bacilli, and was therefore, at that time at any rate, unfit for use on the human subject as a means of immunization. I believe the more recent outputs of this T. R. tuberculin contain some antiseptic, or at any rate that this danger has been met in some way by the German manufacturers of the substance, but I have made no test of the later outputs.

You can assure the gentleman you speak of that Koch's original tuberculin cannot possibly contain living bacilli, and that it cannot possibly cause tuberculosis even in the most susceptible animals ; all of which I feel quite certain you have told him already.

Very truly yours,

(Signed) E. L. TRUDEAU.

Letter from Messrs. Parke, Davis and Company, on the preparation of Tuberculin.

DETROIT, MICH., U.S.A., December 14, 1899.

DEAR SIR,—We have your letter of the 12th. We are sending you, with our compliments, two vials of tuberculin, taken from our stock on the shelves. We feel absolutely sure that you cannot induce tuberculosis with this material. In the first place the cultures are heated to boiling, in order to make this material safer to handle. It is then filtered through a Berkfeldt filter, which removes the germs ; then evaporated over a steam water-bath and contains finally 50 per cent glycerine which of itself will, as we have repeatedly proved, in a short time kill tubercle germs. In order to test the possibility of tubercular infection from vaccine we have made a number of experiments, as follows: Virulent cultures of tubercle germs, also fresh tubercular sputum, was mixed with glycernated vaccine. After standing for several weeks large quantities of this material were injected into a number of guinea pigs. In no case did they become tubercular. Like experiments have been repeatedly performed in England. The report of Trudeau was made on the T. R. of Koch, which is entirely another matter, prepared in an entirely different way, and often does contain living bacteria. In other words, our tuberculin is treated in three separate and distinct ways, each one of which is practically sure to either remove or destroy all the germs of tuberculosis.

We are,

Yours respectfully,

PARKE, DAVIS & Co.,
Per M.

Dr. D. MCEACHRAN,
Chief Inspector of Stock, Department of Agriculture,
Montreal, P.Q.

Letter from Prof. Ross, Bacteriological Department, Ontario Agricultural College, on the preparation of Tuberculin.

GUELPH, December 4, 1899.

DEAR SIR,—As I am at present in charge of the manufacture of the tuberculin, Prof. Harrison being in Europe, I am answering your letter of the 1st sent to him.

Our first step in the manufacture of the tuberculin from the broth cultures is to boil it for at least two hours, thus leaving no room for any possibility of the germs retaining any life. Again, in the process of concentration, the tuberculin is submitted to a temperature of between 85 and 90 degrees centigrade for from twenty to twenty-four hours, depending upon the amount to be concentrated. This heating alone would be ample to ensure the destruction of any living bacilli which might be in the tuberculin.

None of the T. R. tuberculin has been issued from this department ; it has been frequently stated by medical men, both in English and continental publications, that T. R. tuberculin does contain the living germs in many cases. This substance has never, to my knowledge, been used in connection with live stock.

Yours truly,

MALCOLM ROSS.

Dr. McEachran,
Montreal.

Letter from the Bureau of Animal Industry on the sterilization of Tuberculin.

WASHINGTON, D.C., December 4, 1899.

DEAR SIR,—In reply to your inquiry of recent date, I would say that all the tuberculin made for use in diagnosing tuberculosis in cattle, in the bio-chemic laboratory of this bureau, is sterilized by heat.

Yours truly,

D. E. SALMON,
Chief of Bureau.

Other letters of similar purport have been received, but I trust the above will be sufficient to convince those who, moved by prejudice or ignorance, continue to assert that 'the most eminent specialists agree that in very few cases can it be applied without danger.'

As a matter of fact one might as well expect to see barley grow from putting whiskey into the soil as to see tuberculosis develop from the injection of tuberculin under the skin of an animal.

TUBERCULOSIS REPORT FROM PRINCE EDWARD ISLAND.

By referring to the report of Inspector W. H. Pethick, V.S., it will be seen that the efforts towards eradication of tuberculosis are meeting with the hearty endorsation of the stock-raisers of the island.

Mr. Pethick says :—

'During the past year I have had the pleasure of meeting a large number of farmers and dairymen at meetings held in various districts, and discussing with them the important subject of contagious diseases in animals, dealing more especially with tuberculosis in cattle ; I am glad to inform you that the stockmen of this province manifest increasing interest in this important matter. I may just say that I find our stockmen not only anxious to rid their herds of this disease, but willing to give every assistance to any movement that may have for its object the eradication of tuberculosis from the province.

In my opinion, this would not be a very difficult matter to accomplish ; the very limited extent of the disease on the island, consequently the small amount of money necessary for compensation ; the willingness of the stockmen to aid in the work ; our isolated position (geographically), our Provincial Stock Act providing for the quarantining and testing of all incoming cattle, that are not accompanied by a health certificate signed by an official veterinarian, and the valuable object lesson the accomplishment of this work would be to the rest of the Dominion ; encourage our people to hope that the matter may receive your favourable consideration.'

Laws of Prince Edward Island.

An Act respecting Tuberculosis in Cattle.

[Assented to May 19, 1899.]

Be it enacted by the Lieutenant-Governor and Legislative Assembly of the province of Prince Edward Island, as follows :—

1. In this Act the expression 'cattle' means bulls, cows, oxen, heifers and calves.

2. The Lieutenant-Governor in Council may from time to time and when deemed necessary appoint an Inspector or other officer for the purpose of carrying into effect the provisions of this Act.

3. Every person importing or bringing cattle into this province either for breeding, grazing, feeding or dairying purposes shall give immediate notice to the Inspector appointed in pursuance of this Act, and every person who neglects to give such notice shall incur a penalty not exceeding one hundred dollars.

4. All cattle imported or introduced into this province, accompanied by a certificate signed by an official veterinarian, showing that they have been submitted to the tuberculin test and found free from tuberculosis, said certificate giving the date of testing with a chart of reaction and a description of the cattle, with age and markings, and verified by affidavit if required, that the certificate refers to the cattle represented, shall not be subject to detention in quarantine unless otherwise ordered by the Inspector.

5. All cattle when not accompanied by the certificate and affidavit, if required, as by the next preceding section mentioned shall be detained in quarantine for one week under the supervision of the Inspector, and during such detention an inspection shall be made and the tuberculin test applied.

6. Cattle found free from disease at the end of the period of quarantine will be released, but should there be found tuberculosis in any of such cattle tested as aforesaid, such cattle shall be destroyed or disposed of as the Inspector shall direct.

7. If any cattle are imported or introduced into this province, or attempted to be imported or introduced contrary to the provisions of this Act, the same shall be forfeited and may be forthwith destroyed or disposed of as the Inspector shall direct, and every person who imports or introduces or attempts to import or introduce any cattle contrary to the provisions of this Act, shall incur a penalty not exceeding one hundred dollars for every animal so imported or introduced or attempted to be imported or introduced by him.

8. Any Inspector or other officer appointed under the provisions of this Act, may at any time for the purpose of carrying into effect any of the provisions of this Act, enter any common, field, or stable, cow-shed or other premises where he has reasonable grounds for supposing any diseased cattle may be found, and every person

who refuses admission or in any way obstructs or impedes an Inspector or other officer acting in execution of this Act, shall for every such offence incur a penalty not exceeding fifty dollars.

9. Every penalty imposed by this Act shall be recoverable with costs before any two justices of the peace, or any magistrate having the powers of two justices of the peace under the "Act respecting Summary Proceedings before Justices of the Peace."

This subject is worthy of consideration, and as Mr. Pethick remarks, the eradication of the disease from the island province would be a very valuable object lesson for the whole Dominion.

INTERCOMMUNICABILITY OF TUBERCULOSIS.

The following report recently received from one of the district inspectors, illustrates the relationship between human and bovine consumption. He says in reporting the testing of a herd in which a diseased animal was found :—

'The cow marked "diseased" is not the property of the owner of the herd, but belongs to a widow who sent her to be wintered to the farm of the owner of the herd —all of which except this cow are healthy—having given no reaction to the test.

This woman's husband died of consumption last spring ; she also lost a child from tuberculosis and shortly after her husband's death her dog showed symptoms of tuberculosis, and on destroying him I found him similarly affected.'

Fortunate it was that the owner of the herd discovered this plague-smitten creature before she had time to infect his whole herd, as, by cohabitation with them for the whole winter she would most certainly have done.

A HERD OF 17 DAIRY COWS LOST BY THE INTRODUCTION OF ONE TUBERCULOUS ANIMAL.

In a recent test made by Inspector Moore, he reports finding in a herd of 21 head no less than 17 tuberculous, 1 suspicious, and only 3 healthy. A diseased animal was introduced to the herd seven years ago, and no doubt the disease has been in existence, and accounts for the many deaths since then.

MANGE IN CATTLE ON ALBERTA RANGES.

In my report for the year 1898-99, I dealt with the subject of mange in cattle on the Alberta ranges. This disease, which had existed in the southern part of Alberta for a number of years, has, during the last two years, assumed a more aggravated form. It has extended over a larger tract of country, numbers of cattle having been reported as affected by this disease in the neighbourhood of Lethbridge and the Little Bow River, and in fact nearly the whole of southern Alberta from Calgary to the boundary line, east as far as Medicine Hat and Maple Creek, and north to the Red Deer River has been more or less affected.

By reference to the reports of the North-west Mounted Police for that year, it will be seen that the total number of cattle quarantined and treated for mange in the territories by the mounted police, was 2,018, which probably did not represent one half of the infected animals.

A dipping station was erected by the stock-owners at Rocky Coulee, 8 miles southeast of Macleod. This, however, owing to vexatious delays of one kind or another hindering the completion of the work, was not brought into use until too late in the season to have had as many cattle dipped as there should have been. However, Dr. Wroughton, who was the mounted police veterinarian in charge of the dipping chute, states in his report that 686 head of cattle affected by this contagious disease were treated at the dipping station.

In a letter which was received from State Veterinarian Knowles, he says, speaking of the cattle in northern Montana (the country immediately south) :—

'The condition of the scabby cattle on our northern ranges is bad, in fact so bad as to excite the alarm of our cattlemen. They are now almost ready to construct six vats in the northern part of the State. It was my desire, and I endeavoured to bring it about, that our northern roundup association appoint a committee of three to confer with a like committee appointed by your stock association: the committees to meet at some given point, confer about this matter, and work in unison towards its extermination, but unfortunately it was not accomplished. Could you not get a committee like this appointed by your association, and have the secretary write to the Montana people and request them to appoint a similar committee to take this matter in hand. It was a God-send to our cattlemen that the past winter was not a severe one. It is my honest belief that at least 30 per cent of the cattle in northern Montana are suffering from sarcoptic scabies."

The following is an extract from the bulletin issued by the same gentleman to the stockmen of Montana :—

"All cattlemen of long experience with this disease on Montana ranges maintained, until shown the psoroptes, that the disease was due to "hard winters ;" from the freezing and thawing of the snow accumulating on the backs of the cattle, and long continued cold winters. They say the disease has been particularly noticeable after our very hard winters, and that after an open, mild winter, but few cases of it have been observed. It is also said that the disease is much worse on the open plains than where there is shelter, such as is afforded by the "breaks" along the Missouri, Marias, Teton and other streams, and in the mountains. My observation has been that the disease persists with equal severity on the plains and in the sheltered places.

'It is difficult, under range conditions, to arrive at an accurate estimate of the number affected with the disease, but from my observations during the past year, would regard as a conservative estimate of the cattle ranging north of the Missouri River, and from the mountains to the Dakota line, that about three per cent are affected. This estimate refers to cattle plainly showing the disease, but there is no doubt that equally as great, or greater, percentage are affected, that during the warm summer months show no evidence of it until cast and carefully examined.

'The problem of promptly and successfully stamping out this disease, under range conditions, is one of considerable magnitude. The disease is easily cured under close domestication, where cattle are gentle and easily handled, but as is well known, range cattle are wild and difficult to manage, and when large numbers must be handled, the process of hand-treating them is slow and unsatisfactory, for it necessitates casting each animal to properly apply the remedy, and then if not carefully supervised by one of experience, some diseased part may be overlooked.

'I give it as my opinion that to successfully and economically handle this disease, it will be necessary to construct dipping vats in the infected areas, and dip the diseased cattle as sheep are dipped. There is no doubt but that the initial expense of this procedure will be relatively large, but taking into consideration the number of cattle to be dipped will minimize it, and, without question give better results in the end. The treatment so far adopted this year has been hand-treating with paraffine oil and sulphur, and the results up to date have been fairly satisfactory, where supervised by experienced men.'

During the winter a large number of animals suffering from this disease were treated on the various ranches, bulls especially. During the month of February I drove over a large portion of the Foothill country, and wherever I went I saw at nearly every ranch I stopped at, several mangy animals. In April I inspected a herd north of the Red Deer River, in which a large number were mangy. I heard of others in that district, and saw a number of mangy cattle near Gleichen.

With a view to awaken an interest among stockmen, circular letters were issued by the stock associations and distributed among their members, containing information as to the nature of the disease, and the manner of dealing with it, and urging each and all to work actively with a view to its eradication. An effort was also made by these associations to obtain a large attendance of stockmen at the annual meeting which was held at Medicine Hat on April 12 and 13, last. The meeting was the largest and most representative one of the kind yet held in Alberta.

The annual report of the board of management of the Western Stock Growers' Association commences with the following remarks on the subject of mange in cattle :—

'The various resolutions passed at the last annual meeting have been taken up during the year with varying results. It will be remembered that at that meeting a considerable discussion took place as to the prevalence of mange on the range, and a resolution was passed which was expected to be of sufficient scope to cover the subject. At a subsequent meeting of the board, however, on June 9 last, and at which Dr. McEachran and Commissioner Herchmer were present, the whole subject was again gone into most carefully and thoroughly, and the board became convinced of the urgent necessity of immediate and thorough action. The only practical way of getting at the root of the evil seemed to be to establish dipping stations at central points, for although individuals might gather and carefully treat their own diseased animals, still there is bound to be a percentage of strays whose treatment it would be nobody's business to undertake, and unless the treatment can be made universal it cannot be expected to be efficient.'

At the meeting, after a lengthy discussion, the following resolution was carried :—

'Moved by Howell Harris, seconded by F. S. Stimson, That the Minister of Agriculture be requested to order that upon the coming general spring round-up, all cattle affected with mange within the limits of our association's district be gathered, and that said cattle shall be driven to the nearest dipping chute and there be properly dipped under the supervision of a government veterinary surgeon, and discharged only when directed by such officials. That the North-west Mounted Police be requested to furnish at least one policeman to accompany every round-up and see that the law and orders in council governing contagious diseases be properly carried into effect.—Carried.'

The resolution passed at the general meeting dealing with mange was thoroughly discussed at a subsequent meeting of the executive committee, together with the means of most practically dealing with its recommendations, and the following resolutions were submitted and passed :—

'Moved by A. B. McDonald, seconded by W. R. Hull, That the secretary write to the Montana Stock Association intimating that parasitic mange exists on the Canadian ranges, and that it is reported to be equally prevalent among the Montana cattle to the south of the international boundary line. This association would respectfully request the co-operation of the Montana Stock Association in its efforts to eradicate this disease, and would be pleased to receive any suggestions as to the most practical method of dealing with it in an effective and simultaneously conducted manner.—Carried.'

'Moved by C. Kettles, seconded by R. Duthie, That the secretary and the southern manager draw up a circular and forward it to all members informing them of the steps required by the government to be taken this year for the eradication of mange. All animals showing the slightest suspicion of mange must be gathered by the spring round-up and dipped under the supervision of a government inspector, the district associations to instruct their captains of round-ups to gather every suspicious animal, irrespective of ownership, they find on the range. It is recommended that so far as possible all animals, whether apparently affected or not, be dipped, at least once during the year.—Carried.'

In connection with the former resolution Mr. Preuitt, of the Montana Stock Association informs the secretary, that the existence of mange on the Montana ranges is thoroughly realized, and that active steps are being taken to eradicate it ; while a more recent communication from the State Veterinarian contains the information that the northern part of the state is badly infected, and that it is estimated that no less than 30 per cent of the cattle there are suffering from this disease ; it also states that a number of dipping chutes are being erected and energetic action taken to stamp out the contagion.

Dipping chutes are now in course of erection or are already erected at the following places :—

Pincher Creek, 2, one at Sharpe's ranche, and one at the Dry Fork.
Rocky Coulee (Macleod), 1.
Little Bow (Lethbridge), 1.
High River, including Nanton and Sheep Creek, 3.
Maple Creek, 2.
Medicine Hat, 2.
Willow Creek, 1.

While it is hoped that one or more will be erected in the country west of Calgary.

Eighteen thousand pounds of mange dope is being suplied free of charge to the stockmen by the Dominion government, and will be distributed direct to the various points by the manufacturers, and it is confidently hoped with the thorough and hearty co-operation of every cattleman in the country that a very considerable step towards the final dislodgement of the disease will be effected this summer.

The Order in Council, dated July 14, 1899 being still in force, the administration of the quarantine under the authority of the Animal Contagious Diseases Act, and of this order was placed in the hands of the acting commissioner of the North-west Mounted Police to see that their provisions and the resolutions of the association were carried out, and arrangements were made for the veterinary surgeons of the North-west Mounted Police stationed at Calgary, Macleod, Lethbridge and Maple Creek to superintend the dipping, and Dr. John Hargreave, of Medicine Hat, was appointed local inspector for that district to assist in such work.

The following directions were issued to the veterinary inspectors charged with the administration of this quarantine :—

Directions for Veterinary Inspectors in Charge of Mange-dipping Stations.

You will visit the several dipping stations of which you have professional charge, as often as you can.

It will be your duty to assist the cattlemen employed in dipping by seeing that the vats and corrals are in good order, that all cattle, even those only slightly affected, are gathered and dipped. Where need be, owing to negligence or indifference of owners, you will, acting under the Animal Contagious Diseases Act and Order in Council of July 14, 1899, cause infected cattle to be brought to the dipping station, dipped and treated till cured, retaining them till all expenses are paid by the owners.

You will, as soon as a dipping vat and corrals in your district are prepared, conduct experimental dipping to ascertain exactly the requisite strength of the dip to kill the acari without injuring the animal. The vat holds 2,500 gallons, each barrel of soap, 400 pounds. Commence with 500 pounds of the soap in the vat full of water ; it should be dissolved in hot water and must be kept well stirred. After the animal has dried, examine with a lens the surface of the skin or portions of scab to see whether or not acari have been killed—if not, increase the strength of the solution till a curative effect is attained without injury to the eyes or skin of the animal. In passing them through the vat endeavour to have them retained a few minutes in the bath, and use scrubbing brushes on long handles to rub the solution well into the skin.

Calves may be held and scrubbed in the solution, holding the head well out of the fluid, which might irritate the eyes.

Pass the cattle through the dip as often as convenient, but not less than weekly. If there be only a few animals under treatment, they may be dipped two or three times a week.

The success of your work will largely depend on the thoroughness of gathering all infected animals off the range, the dip being of the requisite strength and being thoroughly applied to the skin by dipping and rubbing, and on your removing all sources of infection in the corrals—fences, trees and rocks—by lime wash or washing with the dip. Energetic work done this summer should eradicate this disease, but indifference, carelessness or wilful neglect may render what is done useless. Thus, it is clearly your duty to see that what is done is done thoroughly, and whenever owners neglect or refuse to treat their animals, it is your duty to enforce the provisions made by the Order in Council for such cases.

D. McEACHRAN,
Chief Inspector.

Directions were also given that their duties were to be performed with the least possible hindrance to the business of the stockmen, and that contact cattle were not to be rejected from shipment, but no animals showing any symptoms of mange or bald patches on the body were to be shipped. Permission was also given to owners of cattle, and cattle-dealers who wished to do so, to send animals affected by mange, under veterinary supervision, to the abattoir at Calgary. Movement of animals, in the quarantined district which were not suffering from mange, was also permitted, under veterinary supervision, so that the purchasing of the cattle, free from disease, for stocking ranches was not interfered with.

With a view to furnishing accurate information as to the true nature of the disease, and suggestions as to the best methods of dealing with it, the following bulletin, dated December, 1899, was issued by the department, and distributed among the stockmen in Alberta :—

SPECIAL BULLETIN FOR STOCKGROWERS IN THE NORTH-WEST TERRITORIES.

MANGE IN CATTLE.

This disease is due to irritation of the skin produced by minute parasites, *acari*, which resemble cheese mites, and like them may be seen by aid of a magnifying glass or low power object glass of a microscope : sometimes when numerous and the animal is held in bright sunlight they can be seen as minute whitish specks by the naked eye, or they may be transferred with the scab to the human arm, or the surface of a black paper when they will be seen in clusters on it, if exposed to the sun for a few minutes.

They belong to the order *Acaridae*, class *Arachnidas*, family *Psoroptes* (*Dermatodectes*).

The *Dermatodectes Communis* is that usually found in enzootic mange in cattle, and its discovery only should be relied upon to determine the diagnosis ; while several other conditions will produce loss of hair, *Alopecia*, it requires the actual presence of the *acari* to constitute mange.

It prevails during summer, but as winter approaches it becomes most apparent on the range, reaching its worst stage about the months of February or March, recovery appearing to take place as summer advances.

It commences at the root of the tail, neck, or shoulders, often spreading over the whole body. The itching is often considerable and prevents the animals from feeding or resting, consequently they become emaciated. From the abrasion of the

skin by rubbing against fences, buildings, trees, or rocks, sores are produced, vessicles cover the skin and a viscid fluid exudes, which drying, forms crusts or scabs, which become hard, ulcers frequently forming under them.

The skin in chronic cases thickens and cracks, the hair falls off, the animals present a miserable appearance and, as winter hardships overtake them, death inevitably follows.

We are indebted to the late Professor Gerlach, of Berlin, for much valuable research work on the life history of these parasites. "They deposit their ova on the skin; when seven days old the *acari* are ready for procreation and probably about the 23rd day a second generation appears."

Gerlach makes the following calculation, estimating the product of each female as fifteen and allowing the procreative faculties to be in operation when these are fifteen days old, which affords some idea of the rapidity with which the parasites breed.

		Females.	Males.
1st Generation after	15 days.....	10	5
2nd "	30 days.....	100	50
3rd "	45 days.....	1,000	500
4th "	60 days.....	10,000	5,000
5th "	75 days.....	100,000	50,000
6th "	90 days.....	1,000,000	500,000

'Thus a male and female will produce 1,500,000 descendants in about three months.' *Fleming's Sanitary Science and Police.*

It takes 14 to 16 days from the date of transference of the *acari* to the skin before any marked symptons are noticeable, therefore, treatment should be commenced as soon as they are discovered and dipping or dressing should be repeated at least within fifteen days at most so as to kill the fresh crop before they commence breeding.

The disease spreads readily by the animals rubbing against one another whereby the *acari*, or the eggs, are transferred to the hair or skin ; also by rubbing against a fence, post, tree, rock or wall where an infected animal has previously rubbed.

The hands, clothing, halter, rope or anything that has the parasites or their eggs attached to it may spread the disease.

The treatment being followed in the present epizootic outbreak in Alberta consists of immersion in a solution of impure carbolic acid, quick lime, carbonate of soda and soft soap, (a modification of Zundel's prescription for sheep scab). This if necessary, can be made more effective by the addition of tobacco juice as recommended by Professor Ostertag, of Berlin. A tank connected at one end with the corral by an incline and with a chute and dripping pen at the other end, is so constructed that when in proper running order from 600 to 800 animals a day can be dipped.

In cases of mange in domestic cattle,—particularly bulls, they being specially exposed to infection, and specially prone to convey it to females,—they should be housed in isolated buildings, which should be frequently whitewashed as directed in section 3 of the Order in Council herewith appended.

Provided the stable is warm enough, the whole of the body should be washed with soap and water, well scrubbed with a broom brush, then rubbed dry and the following ointment applied with the hand or a stiff brush :

Sulphur.....	8 lbs.
Oil of tar.....	8 ounces
Linseed oil (raw).....	2 gallons

Mix.

This ointment should be well stirred while being used ; apply it daily, washing with soap and water every second day, till the itching ceases.

Breeders should on no account neglect the very slightest appearance of mange in their bulls—here 'a stitch in time' will save not only nine but hundreds of nines.

As reports recently received by the department indicate that the disease exists to a considerable extent and is extending its area of infection,* active measures should be carried out by the joint co-operation of the stockmen and the cattle quarantine service, assisted by the North-west Mounted Police, as early in summer as weather will permit. Attention is specially called to the several clauses of the Order in Council, herewith appended, wherein the duties of every stock-owner in this relation are defined, as well as the authority by which quarantine measures can be enforced, and the penalties to which any person contravening the provisions of any of the clauses exposes himself.

Stock-owners having cattle affected with mange are strongly recommended to send all their range animals which have been exposed to infection to the dipping chutes, where they will be more effectively dealt with by experienced men who are provided with proper facilities, than they are likely to be by any extemporized arrangement at the ranch.

With a view to enable associations or private individuals who wish to construct dipping chutes for the more thorough treating of animals affected by mange the following directions and diagrams were also distributed among the stockmen :—

DIPPING VAT AND CHUTE.

The unfortunate extension of mange on cattle over a large area of the territories necessitates the active co-operation of every one interested in cattle-raising in a determined effort to stamp out the trouble.

Last summer a dipping vat and chute, the plans of which are given herewith, was constructed on plans adapted from the diagrams of a dipping vat and chute used by the Bureau of Animal Industry Division of the United States Department of Agriculture in their tick experiments in Texas. The general plan of the vat only is given, the accompanying corrals being omitted. It may be built in connection with

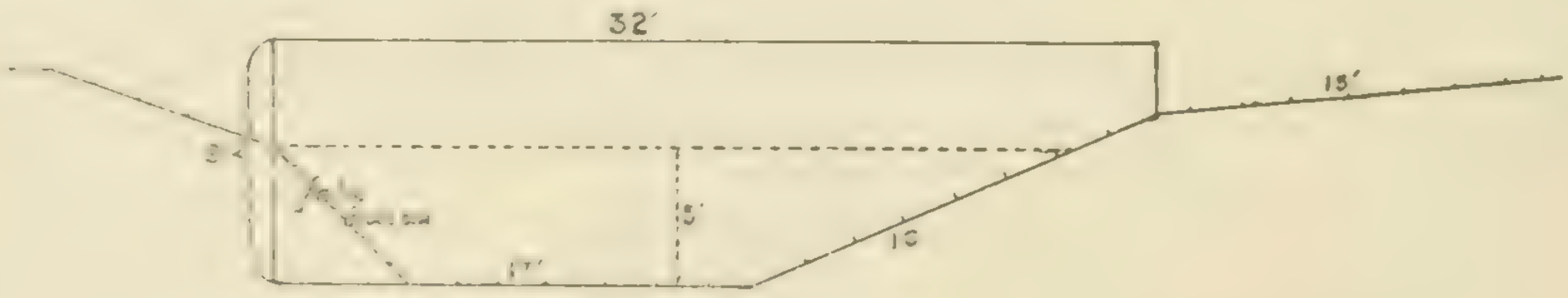

Fig. 1—Sectional view of vat and chute, showing depth.

a suitable corral, or one may be built for it, having a small pen at each end of the vat for holding the number of animals that can be run through at one time. The following plans are suggested, but they can be varied to suit the peculiarities of each location selected. If corrals already built can be utilized the cost of a dipping vat and chute should not exceed $150.

The Minister of Agriculture, Hon. Sydney Fisher, has promised to supply the dipping material ; this, with the free services of the Dominion Veterinarians and the assistance of the mounted police, should make the actual money outlay to the stockmen a very small per capita assessment for dipping the stock.

It is important that this pest be thoroughly stamped out. This can only be done by co-operation, as to be most effective the dipping must be done simultaneously throughout the infected districts. No infected cattle must be left on the range undipped to spread infection.

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* Note.—686 head were dipped at Rocky Coulee.
Col. Herchmer reports a total of 2,018 head quarantined and treated during the past Summer.

The vat itself, Fig. 1, is 32 feet long at the top and 17 feet at the bottom. It is built of 4 x 4-inch. upright timbers placed 3 feet apart, planked inside with good 2-inch plank and well caulked. It is 7 feet wide at the top and 2 feet wide at the bottom. See Fig. 2.

The total depth of the vat is 9 feet, but it is never filled to a greater depth than 5 feet, and will then hold about 3,000 gallons. A short narrow chute, Fig 4a, leads to the vat, of which the last few feet slope to the level of the dipping fluid. A false

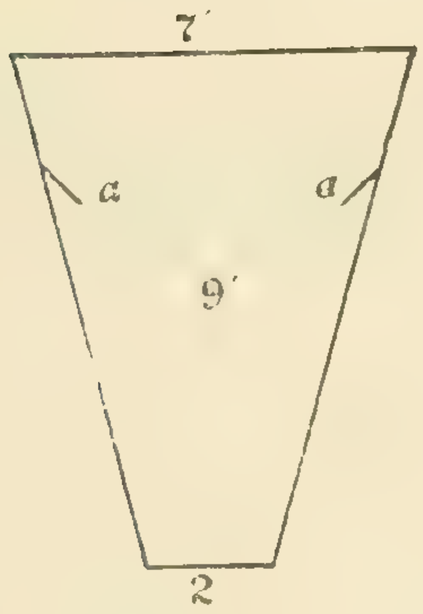

Fig. 2—A cross-section of the vat.

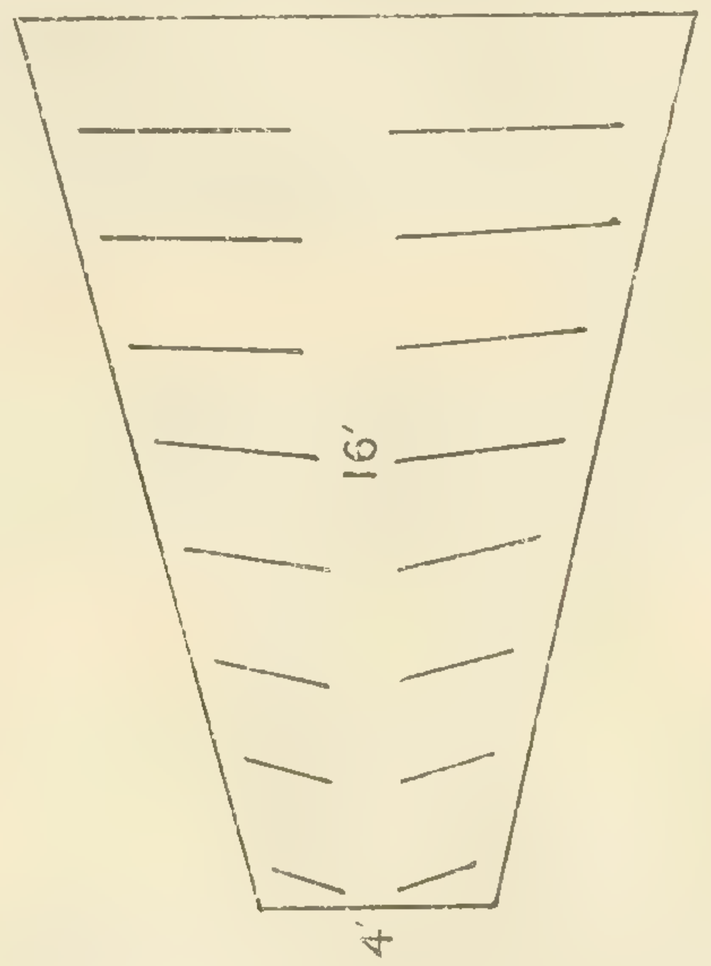

Fig. 3—Dipping platform.

bottom, Fig. 1, directly underneath the slope of the chute, compels the animals to swim forward to make room for those following, as a number are run through together. The vat is narrow enough to prevent an animal from turning round in it. Thus each animal is thoroughly immersed.

An incline, Fig. 4e, leads from the end of the bottom to the top of the farther end of the vat, where it is joined to the dripping floor, Fig. 4f and 3. This is a platform 16 feet long, 4 feet wide, where it connects with the incline in the vat and 12 feet wide at the farther end. It is fenced in with boards, slopes slightly towards the vat, and, like the incline, is heavily cleated to prevent the animals slipping.

The vat should be provided with a tongued and grooved cover, which for convenience of handling, is divided into three sections and is attached to one side ; that side, for the purpose of drainage, is built slightly higher than the other. The cover protects the dip from sun, rain and dust and should always be kept closed when the vat is not in use.

In using the dipping vat only as many animals are let out of the corral into the small pen at the end of the vat as can stand on the dripping platform, 8 or 10 head.

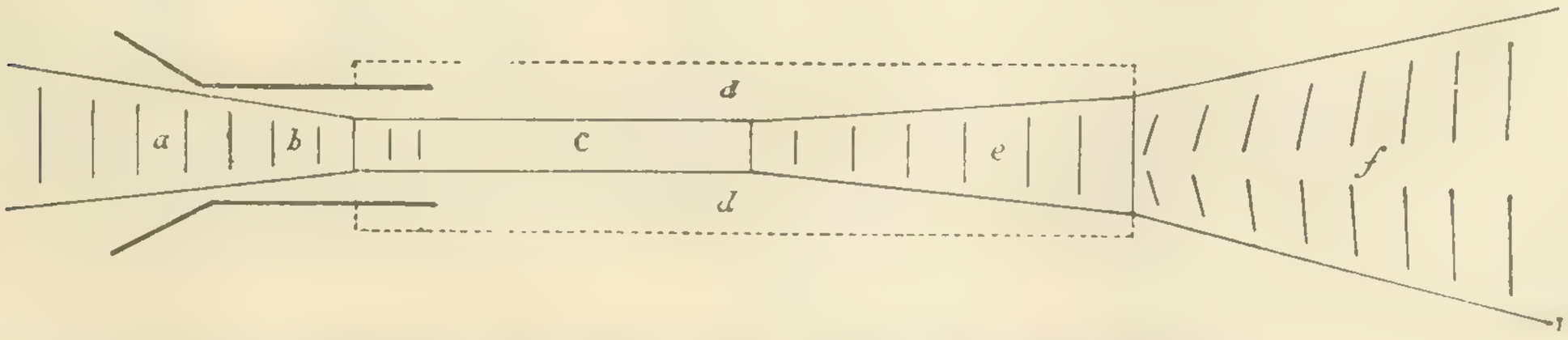

Fig. 4—Ground plan of the vat and chutes.

a—Chute leading to the vat.
b—Inclined floor.
c—Bottom of vat ; 2 feet wide.
d—Shows width and length of the top of the vat.
e—Incline leading from the vat.
f—Dripping platform.

They are let go through the vat one at a time and allowed to drain on the dripping platform for a few minutes that as little of the dip may be lost as possible. It is always well to retain one or two animals on the dripping platform, as the fresh bunch will enter the vat more readily if they see animals on the other side.

The Commissioner of the North-west Mounted Police in his report says :

'Mange which threatened to become serious in the Medicine Hat district a year ago has been successfully coped with, though it is probable that it will again show itself this coming winter and spring,' and again he says :

'All veterinary inspectors think that this disease has been controlled, and if the same measures are persisted in next year, as this just passed, it ought to be wiped out. I apprehend that it will require vigilance at the spring round-up and a careful application of the necessary remedies.'

D. Coristine, V.S., Maple Creek, in his report says :

'Mange was prevalent last winter and spring throughout the district, more especially in the Medicine Lodge, East End and Skull Creek localities. I made several trips to these and other points during the winter and spring and urged on the ranchers the necessity of dealing energetically with the disease as it appeared, so as to keep it under control as much as possible.

'I am pleased to say that the ranchers generally realized the importance of doing this, and did their best to keep it in check, thereby preventing it from assuming the proportions it otherwise would have done. When spring opened up and the cattle began shedding their old hair the mange began to disappear and did so to the extent that I have not seen or heard of a case since May last.'

The report of G. Harry Acres, V.S., shows that he inspected fifty-one head of mangy cattle at Nanton, Alberta, on August 21.

The following is an extract from report of Superintendent Deane, dated at Macleod, July 26, 1900.

'On the evening of the 18th inst., Inspector Burnett started for Clairesholm, where on the following day he examined three train loads of cattle, and rejected about 100 head on account of mange. This showed, he said, about the root of the tail and in some instances on the shoulder. The owners intend to dip them at the Sand Hills dip, and will notify him when they are ready to begin operations.'

J. H. G. Bray, secretary of the Medicine Hat Stock Growers Association and stock inspector of the district, writes:

'Our cattle have been remarkably free from disease of any kind, mange has simply almost disappeared. I don't think that we have had more than six beef animals turned back during the season.'

R. G. Mathews, secretary Western Stock Growers Association, writes:

'The number of animals treated for mange on the round-ups (I have of course no information of those treated privately, except that I know that the Cochrane Ranche treated in the neighbourhood of 100 head), was 74 head. This does not include the Little Bow district, as I have received no returns from there. There is no evidence of any fresh outbreak of mange so that one must come to the conclusion that the energetic measures taken last spring proved efficacious.'

By the combined efforts of the associations and individuals, large numbers of animals showing symptoms of this disease were treated during the winter, bulls especially on the larger ranches required particular attention, and many animals, both males and females which, had they not been so attended to, would probably have died during the winter, were thus saved.

This together with the slaughtering for beef of a considerable number of steers and cows affected more or less with this disease materially lessened the number of diseased animals found on the range during the past spring and summer, and it is very gratifying to be able to report that as a result of the combined efforts of the mounted police and the stockmen themselves, the disease has been almost eradicated, and this encourages me to hope and expect, that with the knowledge which stock-owners in this district now possess with reference to this disease, and how to deal with it, it will never again be allowed to spread over the range to the extent to which it occurred two years ago, when probably three or four thousand animals were affected.

I am happy to be able to say that during the shipping season now closed the inspectors at Montreal found it necessary to reject only one Alberta steer affected by mange.

The grateful thanks of the stockmen of Alberta will in due time be tendered to you for liberally supplying dipping material free of cost—thus enabling them at little outlay to themselves to deal successfully with a disease which was a serious menace to the ranching industry.

OPHTHALMIA IN CATTLE.

This disease, to which reference was made in my report for 1897-98 as follows, is again reported to occur occasionally, both in cattle and sheep, in Ontario and the Territories.

ENZOOTIC OPHTHALMIA IN CATTLE AND SHEEP.

A few cases of Enzootic Ophthalmia in cattle were reported from several sections in Ontario.

This disease, which is due to some local cause, is seen occasionally during the summer, in range cattle in Alberta, and some seasons to a somewhat alarming extent, and it is occasionally seen to affect flocks of sheep in Ontario. It is attributed to various causes, such as alkaline dust, minute flies, irritant pollen of certain unknown plants, and bright sunshine.

The symptoms are opacity of usually both eyes, with defluxion of tears, in some cases vision is seriously interfered with, which in range cattle is sometimes very serious, as they have to find their food and often move about over very irregular ground.

It generally runs its course and terminates in recovery of the eyes in about three weeks, sooner if occurring in domestic cattle which can be housed and treated. Occasionally cornitis with ulceration sets in and the usefulness of the eyes may be destroyed.

It is not contagious, but a number of animals in the locality may be affected by their being exposed to the same cause.

Quarantine measures are unnecessary in this disease.

TREATMENT.

Domestic cattle should be placed in a darkened byre and the eyes fomented with tepid water—and sponged with a solution of sulphate of zinc (3 grains to the ounce) in soft, filtered water. In range cattle it must be left to nature. We have usually found it end in recovery without permanent injury.

D. Coristine, V.S., Maple Creek, in his report refers to this disease as follows :—

'I have noticed this summer a great deal of the disease of the eyes mentioned as "ophthalmia" in Staff Sergeant Tracey's report for last year as occurring in a few cases in this district.

'The disease begins with a watery acid discharge from the eyes, and a white spot directly over the pupil from which an effusion gradually spreads over the eye till the whole organ is affected and assumes a whitish appearance. It is accompanied by an acute inflammation, which runs its course in two or three weeks, when it subsides, and the eye gradually regains its normal appearance.

'I do not think it is at all contagious, but that it is caused by alkaline dust, as I have noticed it nearly altogether during hot dry weather, and in localities where there are alkaline sloughs.

HOG CHOLERA.

I have much pleasure in reporting that this disease has rapidly decreased under the preventive measures employed in dealing with it, as will be seen by comparing the reports of two years—thus for 1898-99.

The number of animals slaughtered and the amount of money paid as indemnity was as follows :—

Number of animals diseased	2,166
In contact	2,579
Total	4,745
Indemnity paid	$15,048.82

1899-1900.

Number of animals diseased	742
In contact	707
Total	1,449
Indemnity paid	$5,918.41

1898-99.

Number of farms infected—

	Farms.
Western peninsula of Ontario	66
Toronto district	19
Niagara Falls district	5
Ottawa district	54
Berlin district	12
Port Arthur district	4
Manitoba	11
Alberta, N.W.T.	4
British Columbia	3
	178

1899-1900.

	Farms.
Western peninsula of Ontario	45
Toronto district	4
Niagara Falls district	2
Ottawa district	2
Manitoba	5
North-west Territories	1
British Columbia	1

Referring to the reports of the inspectors who had charge of the administration of quarantine measures in the western peninsula, full details will be found.

Joseph Kime, V.S., Chatham, concludes his report by saying :—'Comparing this report with my report of 1899, shows that by the present system of dealing with them, hog cholera and swine plague can be completely stamped out, which has been done in this district.'

In the county of Essex nearly 50 per cent of the total number of outbreaks occurred. This is explained by Inspector M. B. Perdue, V.S., who states 'the recent severe outbreak has been confined to a line of farms fronting on the Detroit river, owned by some of the most extensive hog raisers in western Ontario.'

He points out the cause very clearly, as follows :—

'In Wayne County, and in many of the townships across the river, in Michigan, swine plague has been prevalent, and recently has been very severe. At this part of the river the current sets in towards the Canadian shore, and as there is always considerable offal washed up that has been thrown into the river from either side, it is quite probable that the infection came from this source.

'The disease followed the river front in a direction opposite to the current, taking in nineteen farms in a distance of four or five miles.

'On many of the farms the hogs had access to the river bank, and on no other farms except those having river front did the disease appear. The present regulations with regard to the quarantine and disinfection, when faithfully carried out, have proved very effective. For three years I have not found a single instance where a second outbreak has taken place on disinfected premises after the quarantine has been removed, although in almost every case the farmers have again taken up raising hogs.'

The report of J. R. Thorne, V.S., Wallaceburg, whose district, including Walpole Island, was a few years ago a hot-bed of the disease is still more satisfactory. He says : 'I have the pleasure of informing you that the health of stock in this district has been good during the past year, no contagious disease having existed with the exception of tuberculosis, actinomycosis and anthrax. I visited Walpole Island frequently but found no disease.'

Walpole Island which is an Indian reservation was a few years ago extensively infected and was the centre from which the infection spread in all directions on the main land.

The report of Inspector Orchard, of Windsor, Ontario, is also very satisfactory, as his district was for many years extensively infected, yet he reports only three outbreaks, 16 hogs being diseased and 33 in contact—the total indemnity being $192.25.

An outbreak occurred at Strathcona (South Edmonton), Alberta, which was reported by Inspector Sweetapple, V.S., North-west Mounted Police, and subsequently by myself. The disease was swine plague, the broncho-pneumonia form of the disease, it was confined to one herd and place, and was promptly and effectively dealth with.

Mr. Sweetapple in his report says :

'An outbreak of swine plague occurred at Strathcona, but the premises were at once quarantined and the disease entirely confined to one herd.'

These results are no doubt due in a large measure to the education of the people by the bulletins which have been freely distributed throughout the country. By these hog raisers are informed of the nature, causes and means of spreading such diseases and instructed in common sense practical preventive measures. On discovery of the disease they at once notify the inspector and the extension of it is prevented by quarantine being established and maintained till it is eradicated completely.

When we consider that this disease costs the United States close on $50,000,000 a year by losses in hogs, (the State of Iowa alone loses about $18,000,000), and that Great Britain and European countries also suffer severe loss from swine diseases, the healthy condition and comparative freedom from contagious disease of swine in Canada are matters for congratulation.

PICTOU CATTLE DISEASE.

I regret to have to report the continuance of this local disease, and that all our efforts to determine its exact causation having failed—investigations have been made by such eminent bacteriologists as Professor Wm. Osler, Dr. Wyatt Johnson and more recently Professor J. G. Adami, Pathologist, McGill University, without determining its true pathology. No preventive efforts have therefore been suggested by them, other than those employed by the department since it first undertook to deal with it twenty years ago.

Dr. George Townsend, D.V.S., has special charge of administering quarantine measures for the eradication of this disease. By reference to his report it will be seen that there were slaughtered as diseased 149 head, for which $1,151.99 were paid as indemnity, as against 112 head and $800.63 similarly paid during the preceding year. As provided by the Act, one-third of the value of an animal before it became diseased is allowed as compensation ; the value being determined by authorized appraisers.

The mode of procedure is as follows :—An owner of cattle on perceiving an animal showing symptoms of the disease in his herd at once notifies the inspector, who forthwith makes an investigation, and if he finds that it is a case of Pictou cattle disease, the animal is slaughtered, after appraisement, and the carcass either burned, or deeply buried and covered with freshly slacked lime. The premises are thoroughly disinfected ; disinfectants being supplied by the department, and a special officer whose duty it is to see that it is done in a thorough manner takes charge of the premises till they are disinfected to his satisfaction.

The disease prevails chiefly during the midsummer months, disappearing almost entirely during the winter. For instance, during the past twelve months, the period covered by this report in November, 1899, there were 12 cases, in December 5, in January, 1900, 1 case, in February 4, in March 5, in April 8, in May 10, in June 18, in July 32, in August 27, in September 15, and in October 12. It occurs most frequently on poor soil and wood-grown fields, but is not confined to these. Many animals are annually shipped from the district wherein the disease prevails, but in no instance has it been thus introduced elsewhere. Diseased animals have been made to cohabit with healthy cattle in byres and in fields without infection occurring. The prevailing popular idea that it is due to the cattle eating ragwort (*Senecio Jacobaea*), vulgarly termed 'Stinking Willie),' is entirely erroneous. That family of plants does not possess poisonous properties. Cattle have been fed on it as much as they could be induced to eat, they have been drenched with decoctions of it without producing any symptoms of this disease. Careful examination and laboratory analysis of the water in use by animals contracting this disease have been made without discovering anything suggestive of its cause.

So far it has baffled the combined skill of bacteriologists, pathologists, chemists, botanists, agriculturists and veterinary clinitians to define its true nature or cause. The measures employed have limited its area, and lessened the numbers affected. This is proven by its increase when there has been any relaxation in carrying of them out. Still it continues to lurk around and occasionally reappears in the original localities in spite of everything yet suggested as a preventive.

ANTHRAX AND SYMPTOMATIC ANTHRAX OR BLACK LEG.

These diseases continue to occur here and there throughout the Dominion, but in no instance has it caused serious loss, only a few animals dying at a time.

Mild outbreaks have been reported from the following places :—

ANTHRAX.

No. of Outbreaks.	Locality.	Province.	Inspector.	No. dead.
1	Ste. Thérèse	Quebec	A. E. Moore, D.V.S.	9
1	New Glasgow	"	" "	10
1	Bulwer	"	" "	3
1	Amgance	New Brunswick	J. H. Frink, D.V.S	1
1	St. John Co	"	" "	1
1	St. Andrews	"	A. E. Moore, D.V.S.	2

SYMPTOMATIC ANTHRAX.

1	Maxville	Ontario	J. Irvine & A. E. Moore	50
3	Whitewood, Blackwood, Medicine Hat	Assiniboia	R. G. Mathews & J. Hargrave	7
1	Edmonton	N. Alberta	C. H. Sweetaple	9

As explained in previous reports, these two diseases, although not identical, are very similar as regards causation, that is to say, they are each produced by rod-shaped bacilli which are spore-bearing. These differ mainly in the one which produces anthrax being aerobic, requiring oxygen to produce sporulation, and by the consumption of which in the blood they render that fluid incapable of maintaining life, hence its suddenly fatal character—affected animals usually die without symptoms being observed. While those producing black leg or symptomatic anthrax are anaerobic, do not require oxygen, and are supposed to kill by obstructing the minute capillary blood vessels, producing local tumefaction, usually on the hind quarters or shoulders, of a painful inflammatory character, which extends rapidly, becoming gangrenous, insensible and crepitant. Death may be sudden, but usually symptoms are observable for twelve to thirty-six hours. After death, if the tumour be cut open, it will be found black, gangrenous in the focus, and for a considerable distance around it the tissues are infiltrated by a yellowish serosity.

The anthrax bacilli and the spores die within a short time after the blood has ceased to be oxygenated by respiration, unless air be admitted to them by cutting up the carcase, but they sporulate rapidly if exposed to the air. According to Masselman. 'The spores produced after coming in contact with the external air are completely

resistant to decomposition, and in bodies from which the skin has been removed the exposure of a large number of bacilli involves a more abundant production of spores than in those which have not been skinned'; and according to some authors these spores themselves can pass through the different phases of their evolution in the soil and give rise to new generations, whereas if deprived of oxygen they rapidly undergo decomposition.

It will thus be seen that carcasses of animals dying from anthrax should not be opened; not only so, but the nostrils, mouth and anus should be stuffed with tow or cotton wool saturated in carbolic or creolin solution, and the body carefully placed in a wagon—on no account dragged along the ground—to the place prepared for burning it. If buried it must be eight feet deep in dry soil, and covered with one or two barrels of lime.

Anthrax is not communicable by contact of living animals; at the same time owners of stock should at once remove the uninfected from any field in which a sudden death occurs, or if it occurs during the winter they should at once change the food and water.

SYMPTOMATIC ANTHRAX OR BLACK LEG.

This form occurs most commonly in young stock during summer, when from three to fifteen months old. Usually those most vigorous and thrifty are attacked, and seldom any large number at one time. It is usually fatal.

Treatment is rarely successful. The entire herd should be at once removed to another pasture, where the grass is less abundant, and they are less liable to become plethoric.

PREVENTIVE VACCINATION.

Anthrax vaccine and symptomatic anthrax vaccine, as now prepared by the Pasteur Institute, 50 Fifth Avenue, Chicago, Ill., can be employed as a preventive of these diseases. Three herds, one at St. Andrews, N.B., one at New Glasgow, P.Q., and one near Terrebonne, P.Q., were rendered immune from anthrax during the past summer by this means.

Owners of herds in which either of the diseases appear should at once procure fresh vaccine, and the syringe necessary for its use, and have the whole herd vaccinated according to the printed directions furnished with it.

Two vaccinations are necessary, No. 1 and No. 2 vaccine, with an interval of eight days.

SHEEP SCAB.

This disease which a few years ago prevailed in Ontario and the districts of Assiniboia and Alberta in the North-west Territories, to a considerable extent is now almost if not completely exterminated.

On December 20, 1899, three sheep brought from Ontario were rejected at St. John, New Brunswick, affected with scab.

During the past summer scab existed in the ridings of North Victoria and North Ontario, province of Ontario, twenty farms were quarantined and the sheep successfully treated under direction of your inspectors.

By referring to Prof. Andrew Smith's report, it will be seen that scab was discovered in some sheep imported from Wyoming, U.S., to Whitchurch, Ontario, in March last, which was also effectively dealt with, and was not allowed to spread from the infected farm.

Veterinary Staff Sergeant Hobbs, reports 'two outbreaks of scab in sheep in the Calgary district which have been successfully dealt with.'

It is to be hoped and expected that with the fuller knowledge possessed by stock-raisers generally of such diseases as sheep-scab no one will be so culpably negligent as to allow this disease to spread in a flock—when by cheap and simple means it can be speedily arrested and exterminated.

INSPECTION OF STOCK YARDS AND CARS.

By reference to the report of Mr. Auger, inspector of live stock cars and yards, it will be seen that the railroad companies are alive to the requirements of live stock transportation with a minimum of inconvenience to those engaged in it. The complaint of detention of animals in the yards after being unloaded has been removed, cleaning and disinfection of cars are now being satisfactorily performed.

There has also been some improvement in cattle and hog cars passing in transit from points in the United States.

He also reports much needed improvement in the railway stock yards, and the willingness shown by the railway companies to meet the requirements of the trade, by providing water and shelter for the stock. Room for improvement still exists in many of the yards at outlying stations where stock have to be fed and watered en route, in some cases they have to be fed and watered in yards late in the season where they are knee-deep in mud, a condition difficult of prevention yet capable of great amelioration.

ACTINOMYCOSIS (LUMPY JAW).

As explained in previous reports this disease is met with in all countries and climates and occurs in cattle of all ages. Bollinger was the first to recognize the nature of the disease in cattle, he was followed by Siedamgrotsky, Perroncito, Rivolta and Huhn and Johnne.

It is due to a fungus ; Actinomyces, described by Fleming as 'producing nodules consisting of myriads of the vegetable organism designated as above, each mass being made up of smaller nodules, these individually containing nests of felted fungi. Each cluster of the actinomyces having a characteristic daisy outline and radiating lines springing from a dark centre.'

The fungus is classed with the rusts or moulds of plants ; it is found on the grasses, and being taken into the body, usually by the mouth, where, owing to some abrasion of the mucous membrane of the gums, or tongue, or it may be the intrusion of a stalk of grass or spear of barley into the gums or between the teeth the fungus or its spores gain an entrance and work their way into the tissues, invading the bone tissue of the jaws where it works its destructive effects which so honeycomb and destroy the bone tissue as to loosen the teeth which fall out and large lucerating sores form in the mouth or face, or both.

It is a mistake to suppose that this is a disease specially affecting bones. It is often seen in the tongue, gums, buccle membrane and palate as well as the upper and lower jaw ; in the pharynx, larynx, nasal cavities, trachea lungs.

Dr. Osler and I found it in the cavity of the skull in an imported bull which died with symptoms of brain lesion in the Lévis quarantine. I have seen it in the muscles of the thigh in a steer, the specimen being sent by Dr. Wroughton, from Calgary. 'It has been seen in the udders of pigs and the shoulder of the horse.'—(Ostertag.)

TREATMENT.

It is, generally speaking, incurable, yet experiments made by the United States Bureau of Animal Industry at Chicago, in 1893, on 'post mortem examinations being made on 185 animals treated, there were found to be cured 131, or about 71 per cent. The number showing internal lesions was seven, or 3·8 per cent of the animals in the experiment.'

The treatment was the internal administration of from two to three drachms of iodide of potassium from five to six days, or till the toxic action of the drug is produced (iodism). The manure getting dry, hard and coated with thick mucus ; catarrh of the digestive tract, and even hemorrhages may take place. When these symptoms are seen, stop the drug for a week, and give a dose of epsom salts and mashes.

The medicine is given as a drench, dissolved in water. Local impirical applications are freely advertised as cures, consisting chiefly of very powerful blistering combinations of several powerful ingredients, which, in cases where it is recent and local, will usually destroy the diseased tissues, producing a large slough which sometimes arrests the progress of the disease. When, however, it involves deep-seated organs, the local treatment is not to be depended upon.

It has never been known to be communicated from animals to man, and numerous experiments to produce it from animals to animals by cohabitation, and even inoculation have failed. Bollinger carried out a series of experiments which established that the disease could be communicated from cattle to cattle. Previously, Bollinger, Harz, Perroncito, Siedamgrotzsky and Johnne had failed, but subsequently, by using fresh material from the living animal, both Johnne and Ponfick succeeded.

Experiments conducted by Prof. Osler and myself at the Montreal veterinary college failed.

As stated in a previous report, neither the fungus nor its spores migrate far from where they first gain entrance; thus, if the tongue be the organ affected, it is usually confined to that organ; if the gums, it lodges in the cancellated tissue of the maxillary bones; but, of course, some spores may be swallowed, or passing into the blood stream be carried to other organs, though it would seem that this rarely happens.

I have for seventeen years past known Indians in the North-west Territories consume the carcasses of Big-jawed cattle whenever they could obtain them, and usually carcasses of such as have been shot for this disease and left on the prairie are carried off and eaten by them, yet I have never known of a single case of the disease among any of the tribes, Blackfeet, Bloods or Piegans, of whom I have intimate knowledge ; therefore, I conclude that communication through consumption of flesh from Big-jawed cattle by men, if it occurs at all, is very rare, wherefore the wholesale condemnation of such meat is an error, nay, a needless waste. I believe about 90 per cent of such carcasses are quite fit for food, but this should be so determined by the inspector. The European system of condemning it when the disease is general, but passing it when it is only local, should be followed here also ; at the same time as all beef is not killed at abattoirs the public must be protected, as well as the reputation for healthfulness of Canadian cattle, and inspectors must continue to prevent such cattle from being shipped abroad, or from being killed for food except under supervision. They must send them to the abattoirs, thus placing them under the control of the municipal health boards.

Reports of actinomycosis continue to be received from various parts of the Dominion, but in decreasing numbers, and owing to the action of the civic boards of health, especially that of Montreal, in seizing and condemning all animals affected by this disease, and the prohibition of shipment of them by your port inspectors to Britain, it is no longer profitable to bring such cattle to the shipping port. Nine animals only were rejected at the shipping ports for this disease during the past year.

HORSES.

CANADIAN HORSES IN THE BOER WAR.

The following table gives the numbers of horses sent to South Africa with the different Canadian contingents :—

	Horses.
With Col. Otter's regiment.....	5
First contingent Royal Canadian Mounted Infantry.....	375
Second contingent Royal Canadian Mounted Infantry....	375
Strathcona's Horse.....	595
General Hutton.....	3

Purchased and exported to South Africa by Major H. S. Dent, Remount Officer for Canada—

Cobs.	Artillery.	Cavalry.	
500	905	2,380	3,785
		Total.....	5,138

It is gratifying to know that Canadian horses were found most serviceable, and distinguished themselves as did the men and officers in the various branches of the service.

Most of the Royal Canadian Mounted Infantry horses, and all of Lord Strathcona's riding horses, were western-bred cow ponies, bought on the ranches of Alberta. They are described in a report made by me to His Lordship on completion of their purchase as follows :—

'I am glad to report that I have secured 536 horses, about 15 to 15·2 hands high, a few are about 14·3. Ninety-five per cent are thoroughly broken to cowboy work, taught to rein by the neck, stop suddenly, turn on the hind feet as a pivot, stand on the prairie with the reins over their heads, ford and swim rivers, and go at a rapid pace up and down hills. They are stout animals, with good short back and strong quarters, good bone and as active as cats ; horses which know nothing of stables or grooming, accustomed to be ridden half a day or more, and at night simply stripped of saddle and bridle and turned loose to find their food. The riding horses and pack ponies were bought at Macleod, Pincher Creek, along the Foot Hills, at High River, Calgary, Medicine Hat, Maple Creek, Regina and Lethbridge. Sixty-six wagon horses were bought in Montreal, mostly Ontario bred, and a few province of Quebec horses, 15 to 15·3 hands, stout short-legged horses, with good action and about 1,200 to 1,300 pounds.

In conclusion, I would say that hitherto it was not considered possible to purchase horses in Canada for army purposes ; there are thousands suitable for mounted infantry ; not all broken, it is true, but they are being broken now.

'I feel convinced that the mounts will be so approved by the generals at the front that the question will be asked, Can more be got quickly ? They can.'

The following extract from a letter just received from Major Dent, on the subject of Canadian army mounts, is worthy of consideration :—

'I was pleased altogether with the class of horses which was brought before me, but I think great improvement can be made by using the English thoroughbred stallion as a sire, and doing away with the American trotting sire, which, in my opinion, has done a great deal of harm to Canadian horses. I attribute the long back and weakness of back ribs and bones, also smallness of bone below the knee, to the American trotter. I wish to urge on the Canadian farmers and young men in Canada to take to riding

instead of always driving. They would add greatly to their health and happiness by so doing, and enhance the value of their horses 50 per cent. It is difficult to find in the country districts a horse that has ever had a man on its back.'

I am glad to learn that Major Dent's advice is already being acted upon, as he is selecting three thoroughbred stallions for exportation to Canada.

The following letters from Colonel Steele, commanding Strathcona's Horse, places Canadian horses to the front for mounted infantry and scouting purposes :—

PARRDEKOP, August 6, 1900.

MY DEAR DR. MCEACHRAN,—We are with General Buller, and have been continually marching and having occasional 'scraps' since we left Newcastle some two months ago. The regiment is in fine shape and highly thought of by those in command. I saw in the papers some attacks upon the horses bought by you. I regret it very much and wrote you to-day on the subject.

I wish to assure you that the horses are the best in this army. Two squadrons had the 450 spared and they had to do all the hard scouting and advance guard work, while 'C' squadron with the Argentines had to be spared for a long time. We have lost very few Canadians, and have changed our other remounts several times.

We go out to assault a strong position on which are two guns and two thousand men. I hope we shall have good luck there, but we must suffer severely no doubt. Sir Redvers Buller will be in command, and if we succeed our march will be continued to the railway station on the line from Pretoria to Delagoa Bay and assist to corner up a good many. We have had several men killed, wounded and missing, also about twenty horses shot under the riders. One of your big Montreal horses got shot in the adbomen, left side, but did not mind it. We had quite a fight that day, but we were lucky in having none killed, but had several wounded.

With kind regards,

Yours faithfully,

S. B. STEELE.

Dr. D. MCEACHRAN,
Montreal, P. Que.

STRATHCONA'S HORSE,

PARRDEKOP, August 6, 1900.

DEAR DR. MCEACHRAN,—Since the 1st June the regiment has marched something over 700 miles, and the Canadian horses which you purchased have stood it very well. It is the opinion of officers and others who have looked at the horses that they are the best that have been imported into the country, and outside of the native bred pony best fitted for the work.

We have been constantly on the march since joining General Buller's forces, and although we have not been in any real engagement the men have been exposed to sniping, and have occasionally met the enemy in considerable force with guns. On all occasions the work was done to my satisfaction, and Lord Dundonald commanding the 3rd Mounted Brigade, to which we were attached, has told me that he thinks the corps a very fine one.

We are halted for a couple of days here and will join in General Buller's advance northward to-morrow.

I am,

Yours faithfully,

S. B. STEELE, Lt.-Col.

Dr. MCEACHRAN,
Principal, Montreal Veterinary College,
Montreal.

HINTS TO OWNERS OF HORSES RUNNING AT LARGE ON THE PRAIRIES.

Examine your horses feet at least once a month, remove overgrowth of horn with a sharp pinchers or rasp, thus preserving the form of the foot and assuring level and true action.

Overgrown feet if neglected for any length of time will split, toe cracks and quarter cracks are thus produced.

When the foot grows laterally it distorts the whole limb and the horse acquires a habit of in-toed or out-toed movement. These defects of the feet and limbs constitute insuperable objections to the purchase of horses for army purposes or any purpose in fact, and in the cow-pony class are the faults for which most will be rejected by remount officers.

Break your horses by kind and gentle methods ; an unbroken horse or one only partially broken, if bought at all will in no case bring its full value.

Horses kept for sale should be ridden sufficiently to gentle and educate them as to mounting and dismounting, starting and stopping, turning by pressure of the reins (made bridlewise), and change the gaits and paces at the will of the rider.

GLANDERS

Is a specific incurable disease of horses, but communicable to man by accidental inoculation. Horses, asses, goats, cats, guinea pigs, field mice are all susceptible, while rabbits, sheep and dogs are slightly so. Cattle, swine and white mice are immune.—(Crookshank.)

It occurs wherever horses are found, and has been described in the most ancient history of veterinary science. It is met with in an acute and in a chronic form, the former may kill in a few days, while the latter may exist for months or years, the animal continuing to work and enjoy fairly good health, yet be capable of infecting other animals or attendants.

The term Farcy is used when tumefaction goes on to ulceration of the lymphatic glands of the thighs and legs or shoulders.

It is characterized by nasal discharge of heavy specific gravity and glutinuous nature which sinks in water, and adheres round the nostril.

The discharge is usually from one nostril, is constant though not excessive in quantity. The sub maxillary glands are swollen hard and adherent to the jaw ; little nodules form in the nasal mucus membrane, at first yellowish in the centre, with a diffused red areola, followed by ulceration and the production of chancres with a mouse-nibbled appearance, depressed centres and raised irregular edges, with a tendency to become confluent. In advanced cases the purulent discharge may be mixed with blood.

When the lungs are involved, cough is a prominent symptom.

It is due to a microbe (*bacillus mallei*), a motile rod-shaped, straight or slightly curved bacillus, which is aërobic, lives in air; fortunately it is not very tenacious of life. It dies if exposed for two minutes to a temperature of 100°. Hot and dry weather favours its destruction, while cold and wet weather retard it.

The destruction of the bacilli by the desiccating influence of the hot dry air of the Canadian climate, more especially in the far west, is the best possible safeguard against the continuance of glanders in the ranching country, and by a knowledge of this fact we can understand how this disease may be completely eradicated if all horses affected by it are quarantined and killed, and care taken that no fresh importations of glandered horses are permitted.

As tuberculin is a reliable test for tuberculosis, so mallein is an equally reliable test for glanders. When injected subcutaneously, if glanders exists, it produces a rise in temperature, and a local painful tumefaction at the point of injection, which does

not appear if the animal is healthy. By this means any doubts as to the diagnosis by clinical examination can be settled at once conclusively—for it is a very reliable test.

Glanders, fortunately, in the older provinces is rarely met with. Five horses were destroyed in Ontario on one farm, and one more, which had been brought across for racing purposes to Niagara South, was shot because it showed symptoms of this disease.

Ninety-one horses have been shot for glanders in the North-west Territories, and eighty horses or bronchos in Manitoba, during the past twelve months.

In the majority of cases the trouble has been introduced by bronchos imported from the United States.

A large number have been tested with mallein in the Territories and Manitoba. In all cases the shooting of the horse is followed by testing his companions—isolating suspects and thoroughly disinfecting the premises.

The disease is now well under control in the country, but, unfortunately, fresh importations often come in, and in certain stages, unless mallein testing is resorted to, the most careful expert may not detect any indication of the disease on inspection.

TYPHOID FEVER IN HORSES, IMPROPERLY CALLED INFLUENZA.

As early as 1867 I differentiated between influenza and typhoid fever in horses as will be seen by referring to page 164 of 'The Canadian Horse and his Diseases,' where I say, 'Until lately, typhoid fever was not recognized in veterinary nosology as a primary disease, although as an accompaniment of epidemic diseases, such as strangles, influenza, &c., we were familiar with it in all its forms.

'It now occurs in forms so well marked that we are justified in giving it a place in professional nomenclature as a distinct disease.'

At that time it was attributed by me to influences which interfered with the general health and vigour of the animal, among which stand pre-eminently overcrowding, improper ventilation, confinement in damp filthy stables, drinking bad water, holding in solution decomposing organic matters, insufficient nourishment and undue exposure, together with what may be termed generally, atmospheric causes.

Since that time (33 years) innumerable opportunities have occurred to study it in all its varying phases. Since first engaging in horse-breeding in Alberta, seventeen years ago, I have had almost yearly experiences of it, and some years encountering heavy losses from it.

While the term typhoid fever is applied to this disease, it must not be supposed that it is identical with typhoid fever in man, as a matter of fact 'Eberth's bacillus does not occur in equine diseases and its inoculation in the horse remains without effect' (Moussleman). It has its analogue in the so-called mountain fever so prevalent in man during railroad construction in the foothills and mountainous sections of the west, as was seen during the construction of the Canadian Pacific Railroad, not only were large numbers of the workmen affected but many of the Blackfeet Indians died in 1883 from this form of typhoid along the railway. In 1898-1900, during the construction of the Crow's Nest Pass Railroad, hundreds of cases and many deaths occurred from it.

Equine typhoid fever, prevailed extensively and caused severe losses to contractors during the construction of the Calgary and Edmonton Railway and hundreds of horses died from this and carbuncle of the feet and legs during the construction of the Crow's Nest Pass Railroad also.

It has been reported recently by Veterinary Staff Sergeant Mountford, V.S., North-west Mounted Police, Prince Albert, Veterinary Staff Sergeant Sweetapple, V.S., North-west Mounted Police, Fort Saskatchewan, and S. C. Richards, D.V.S., Grand Forks, B.C.

Being informed that Mr. J. H. Macfarlane, an extensive horse-breeder at Battleford had sustained severe losses and discouragement by the disease, I wrote him and

requested to be furnished with a statement as to his experience and observations ; in reply I have been favoured by receiving the following very lucid description of the disease from him.

D. McEachran, Esq.,
Chief Inspector of Stock,
Montreal.

Dear Sir,—Replying to yours, would say that I am pleased to have the opportunity of giving you any information in my power. Have been breeding horses in the Battleford district for twenty-five years, and have lost a large number during that time. I have had no trouble with horses that are constantly stabled, but have had serious losses among those running on the range, and at pasture. Pink eye started in this district early last spring, which caused a large percentage of the mares to abort, and also killed many of the foals. Would say the loss of foals was fully 75 per cent. Nearly all the older ones recovered without treatment ; that disease seems to have run its course, as I hear no more about it. The drawback in the horse-breeding industry is what is called here typhoid fever. Symptoms are dulness, tucked up flanks, loss of appetite, costiveness, constant standing, legs swell from feet upwards, swelling on belly, which in time extends from sheath to breast—drinks freely in first stage, heaving at flanks, passes wind freely, bowels rumble greatly, in females water dribbling—males, pendant sheath—eyes bright, pendant head, back arched ; when walking will strike hind feet against front ones--sore throat, no cough or discharge from nostrils. The heaving at flanks and pulse quickens as disease progresses, patient stands till exhausted, then falls and dies at once without a struggle. In some cases this disease runs its course in ten days, in others will last for months. Many of those that recover are of little use, most of them being weak in the spine. This disease seems to be hardest on colts two to four years old, as it usually attacks one of those ages first. It has always been my custom to isolate affected ones, and to treat according to the best method known here, but so far have had very poor success. Some owners will allow an affected one to remain with the bunch, and perhaps lose only the one. Others have tried the same thing and lost half the bunch. Some years ago, a three-year old filly took this disease; I at once placed her in a loose box, but she became so excited that I put an aged gelding in with her for company ; they remained together till shortly before the filly died. The gelding is still hearty at 24 years old. Again, last fall I allowed a three-year old gelding that had this disease to run with a bunch of twenty head. The colt died after being sick two months, but all the rest of the bunch are still in the best of health and condition. This disease is just as hard on the native Indian pony as on horses of a higher grade. It has been a scourge all through the Saskatchewan district since I came here, and unless some treatment can be found that is effective, the horse-breeding industry will degenerate into breeding ponies, on the principle that if you lose a pony you will not lose much.

The treatment prescribed by the veterinary surgeons who have been in Battleford district has been a failure. In my opinion, the flies have more to do with this disease than we are aware of. They are so numerous as to be a perfect scourge. To give you an idea of what stock have to stand in that way, we began making smudges on May 12 last, and kept them going constantly until September 12. This disease usually attacks during the months of July, August, September and October, when the days are very warm and nights cold; this seems to be the hardest time, probably because the horses are then moulting. It is hard to tell where and when this disease will attack. It broke out last summer among my Clydesdale fillies, with the result that I lost one three-year old, one two-year old and one yearling—one yearling colt recovered. My Clydes have always been carefully wintered in comfortable stables, and on account of always being strong and healthy, thought them proof against this disease, but found

I was mistaken. I may say that they were allowed their liberty as soon as the grass was good in spring. Many ranches are from 25 to 100 miles distant from a veterinary surgeon, and the ranchmen consider it as well to let the horse take his chances as to go that distance to consult one, but if those men only knew how to treat the patient, they would keep a supply of the necessary medicine on hand. Were I allowed to offer a suggestion as to the best way to prevent the loss in future, I would say the most practical move your department could make is to have circulars printed, giving symptoms and treatment, with full directions about isolation and fumigating infected stables; have those circulars reach every farmer and rancher in Saskatchewan district. Where there are no druggists, storekeepers could keep a stock of the required medicines on hand and supply the surrounding country. If this could be done, I am sure it would save many thousands of dollars to the settlers each year. Should you consider the above worth consideration, I would advise prompt action being taken.

I have been informed that there has been considerable loss in stabled horses at Saskatchewan, Rosthern, Duck Lake and Prince Albert. From the symptoms given me by some of the unfortunate ones, I am satisfied it is this same fever. One Rosthern man told me he had lost twelve out of twenty brought from Manitoba four years ago. In low swampy regions this disease is much worse than on high dry parts, and it appears, the farther north we go the worse it is. You are probably aware that in many parts of Saskatchewan district there is considerable bush land, also many small lakes and swamps.

Horses like to go in the water and feed on the tender grass. In bush parts there is a rank growth of peavine (wild pease) that horses feed on, as soon as the flies will allow them. At that time the prairie grass is about cured. Might not the change from dry to green feed have some effect? That is always the most dangerous time. Another thing I should mention is the sudden changes in the weather, when suddenly a cold north wind will bring up as cold a rain, and although it knocks out the flies and allows horses to feed, still their appearance shows that they have suffered. Am not at present able to state the losses in horses within the last year. Breeders in this part are so discouraged by heavy losses, I am sure that anything you can do will be highly appreciated.

Any further information you may require about this disease and district will be cheerfully given to the best of my ability.

Yours truly,

J. H. MACFARLANE.

The following report on this disease has been furnished by J. J. Mountford, V.S., North-west Mounted Police :—

'The fever I spoke of in my report I have often discussed with the different medical men in Prince Albert, and they say it is the same as the typhoid in the human being.

'On post mortem examination you will find perforation of the intestines and the most common cause of death is blood-poisoning, though rupture of the intestines is not uncommon.

'The influenza is similar to the influenza I have seen in western Ontario, and the symptoms vary much and depend on the organ most affected.

'The horses which are running on the open range suffer most from the above diseases, and the horses which are in the stable and are not allowed to run out at all and watered at the river are seldom affected.

'The cause of so much sickness among the range horses is, I am satisfied, caused by the horses eating and drinking out of sloughs which are full of water in the spring and gradually drying up during the summer. The vapour which rises off of one of those sloughs is putrid and the country is full of them.

'May say I have often seen a farmer have his stable on the edge of a small slough, the drainage from the stable running into the slough, winter and summer, and he would be surprised at his horses being sick.'

This disease is also referred to in the reports of Commissioner Perry, North-west Mounted Police, Veterinary Staff Sergeant Sweetapple, V.S., S. C. Richards, D.V.S., Grand Forks, B.C., and W. S. Bell, V.S., Cranbrook, B.C. The latter gentleman also reports another variety of it which occurred in Indian ponies on the reserve south of that place. Here it presented several complications, partaking more of the character of irregular strangles.

Typhoid fever is not the form of influenza western men are familiar with, occurring as it does almost every summer among the cow-ponies. The disease which attacks these ponies is a catarrhal form of influenza accompanied by slight coughing and nasal discharge running its course without complication in about three weeks without treatment of any kind if the weather is fine, longer should it be cold and wet.

It partakes more of the character of epizootic cellulitis or pink eye, and like it prevails most during cold wet weather, particularly when moderately warm days are followed by cold wet nights to which the horses are exposed.

It is usually ushered in by dulness, rigours, fever, infiltration by serious effusion in all submucous cellular tissues, accompanied by nervous depression and general debility, the head is carried low and the gait is tottering. The action of the bowels is sluggish and gastric and intestinal complications are apt to ensue.

During some seasons it takes the form of pink eye when the eyes are affected, being closed and watering ; the pupil is contracted and the conjunctiva is of a dark red hue, the eyelids tumid, hot and tender.

It is sometimes complicated by purpura hæmorrhagica when the legs, sheath, under surface of the belly, brisket, and head become largely swollen ; the nostrils almost closed and the mucous membrane tumid and studded by spots of a bright scarlet hue.

It is found on post mortem examination that the cellular tissue underlying all the mucous membranes is infiltrated, hence the intestines, liver, kidneys, lungs and heart may become more or less severely involved, particularly organs which have been weakened by previous disease.

Sometimes, however, with unstabled horses, if the weather is favourable, it runs a definite course, recovery taking place within a week or ten days. Pregnant mares usually have it in a mild form, but it almost invariably produces the death and abortion of the foal.

Prophylaxis.—In view of the fact of this disease being most commonly observed under circumstances favouring a miasmatic theory of origin, an effort should be made to herd them away from sloughs, particularly during hot dry weather. They should be herded on dry land and watered at a running stream or spring, if possible. Rock salt should be scattered over the grazing grounds, and on the first appearance of the disease—if it is at all practicable—they should be removed to another portion of the range ; if not, they should be given the best shelter possible, but not in a warm stable. *(Beware of sudden transitions of horses from the open ranges to warm stables.)* In addition to hay, or as a substitute for it, give them unthreshed oats. In dealing with a herd medication is not practicable, and the best you can do is to assist nature by nursing them through it the best way you can. As long as sloughs exist and the herd has free access to them, this disease will continue.

To prevent it in stabled horses, see that your stables are constructed on proper principles for insuring free ingress of pure air and thorough removal of foul air by properly constructed ventilating shafts, which should be from two to four feet square, running straight up through the roof from within two feet of the ceiling, and divided in the middle to ensure a circulation of air in them.

See that the drains are properly laid and in good order, and that no stagnant pools exist in proximity to the stable. Young and old horses should be exercised several hours in the open air every day. While its contagious-ness is doubtful, it is advisable not to risk healthy animals coming in contact with diseased ones. Buckets, feeding boxes, drinking troughs, and buildings may be the media by which it is communicated.

The stables should be thoroughly lighted, sunlight is destructive to most disease germs. The walls should be frequently swept, and if possible whitewashed twice a year, and in every case immediately after it has been occupied by sick animals it should be disinfected as directed below.

TREATMENT.

All reducing measures must be interdicted, such as bleeding or purging; benefit will follow the relieving of the bowels by administering half a pint of raw linseed oil, feeding on bran mashes, oatmeal gruel, linseed tea or barley tea. Milk is highly recommended as a sustaining food in these cases.

They should be encouraged to drink cold water impregnated with nitrate of potash, three drachms daily. Two drachm doses of chloride of ammonium, or the same of hyposulphate of soda, given in a mash night and morning will tend to prevent blood clots forming.

Stimulants must be given when symptoms of weakness appear, alcohol, four to six ounces, may be given daily, well diluted, or drachm doses of the Sesqui carbonate of ammonia may be administered in a ball several times in the twenty-four hours. The swollen legs should be bandaged; swellings of the head and nostrils should be fomented with hot water. When purpura sets in ounce doses of spirits of turpentine may be given four times a day, well shaken up in a pint of linseed tea, or drachm doses of chlorate of potash may be substituted. The appetite must be coaxed by offering changes of food, green grass, carrots, &c. The animal should be clothed and protected from draughts, being subject to chills and relapses.

It must be nursed through the convalescent stage by generous diet and judicious exercise.

DISINFECTION OF STABLES.

When the buildings are modern and properly constructed as to air space, light, drainage and ventilation disinfection is a simple matter.

When, however, the stable building is old, perhaps a utilization of some old wooden structure for housing animals, or the make-shift erections of the pioneer in the west who by force of circumstances has been compelled to provide some sort of shelter which because horses are kept in it is called a stable, it is more difficult.

The disinfectant may be gaseous, spray, liquid or solid. The gases most used for disinfection are chlorine and formaldehyde.

In using gas for disinfectant purposes it is necessary to remove the animals, and close up tightly the doors, windows and ventilators.

To generate chlorine gas, place, say 8 ounces of common salt with which ½ ounce of black oxide of manganese has been mixed—in an earthenware plate, then pour three ounces of sulphuric acid over the mixture and stir, when chlorine gas will be evolved. Care must be taken not to inhale any of the fumes as they are very irritant to the bronchial tubes—several plates may be used according to the size and form of the stable. It should be left closed for four hours when it may be opened and air and light freely admitted for several hours before animals are returned to it.

Vaporized formaldehyde is extensively used for disinfecting houses, it is discharged by a special apparatus and is introduced to a room or building by a rubber tube, passed through a key-hole.

Steam is very effective where it can be conveniently furnished.

The liquids used for disinfection are solutions of corrosive sublimate which while much used in human practice is too dangerous a poison to be employed for disinfection of stables or byres. Solutions of carbolic acid, creolin, sulpho napthol or sanitas, may be used either in watery solutions or in combination with lime wash.

Reliable disinfection may be obtained by using a spraying pump and applying a lime wash to every five gallons of which a pound of commercial carbolic acid is added, forcing it into every corner, crack or crevice of the walls, stall, divisions and floors.

The solids used are lime, chloride of lime, and carbolate of lime which are useful for sprinkling floors or mixing with composts and manure heaps.

More powerful chemicals are prescribed for disinfection, but in selecting the abcve we have considered efficiency, safety, cheapness and facility in procuring as most country druggists can supply them.

EXPERIMENT STATION AT OUTREMONT.

The following work was partially or entirely carried out at this station during the past year. Dr. Higgins, bacteriologist in charge was, however, transferred to the William Head quarantine, near Victoria, British Columbia, for the purpose of preparing prophylactic serum for the protection of immigrants against bubonic plague. This caused his absence for nearly nine months from the station. The work was by your orders held in abeyance till his return, and I regret that owing to the lateness of this event his report must be postponed till he has an opportunity of completing his unfinished work at this station.

TUBERCULIN EXPERIMENTS.

Producing immunity in cattle by repeated tests and retesting at three months, no reaction.

Tuberculin from Parke, Davis & Co.; United States Bureau of Animal Industry; Mr. Ross, of Guelph, Ontario, and Koch's as used by the department upon guinea pigs to confirm sterility of tuberculin and the impossibility of it producing tuberculosis.

Bacteriological examination of water from ss. *Montezuma* for typhoid bacilli.

Insertion of celloidin capsules containing living cultures of tubercle to determine relationship between germs from bovine and human sources.

Cohabitation experiments with cattle.

Studies upon etiology of multiple abscess in liver.

DUNCAN McEACHRAN,

Chief Inspector.

No. 14.

CATTLE QUARANTINE.

(A. E. Moore, D.V.S.)

Montreal, December 1, 1900.

Sir,—I have the honour to submit the following report of work done by me during the past year, from November 1, 1899, to October 31, 1900.

TUBERCULOSIS.

I beg to report that during the year I have tested for tuberculosis 869 head of cattle, 177 being in the province of Quebec, and 692 in the province of Ontario. Out of this number, 73 animals were found tuberculous, and 6 suspicious.

The diseased animals have all been killed, about one half were fit for food. Some of these were retests, where the animals were known to be tuberculous, a retest being granted to satisfy the owners. A few of these failed to react the second time, a year later, but on post mortem were found slightly affected. This corresponds with our Outremont experiments. Several others, where there was a reaction on the first test, and none on the second a year after, on post mortem there seemed to have been a healing process going on, as abscess cavities could be plainly seen, but were devoid of the usual tuberculous deposits, and there was undoubtedly cicatricial tissue present. It is on such evidence as these cases furnish that some authors attribute the curative action of tuberculin.

I held a post mortem examination on twenty-two animals in one herd after an elapse of a year from the time they were tested ; all of them were found tuberculous ; only three were rejected as being unfit for food, in them the disease being general, while in nineteen it being local, the flesh was considered quite good to be used as food, showing conclusively that the tuberculin had not aggravated the disease.

ANTHRAX.

I have dealt with three outbreaks of anthrax during the past year, nineteen animals dying with this disease. I have inoculated two herds (forty-six animals) with the Pasteur vaccine as a preventive, and it has proven satisfactory so far.

All animals dying of this disease have been properly disposed of and disinfection carried out as far as possible.

Mr. James Furze, of New Glasgow, P Q., lost eight head of cattle very suddenly, but as it was not reported until the animals were all dead and buried, I was unable to make a positive diagnosis, but suspected anthrax, and dealt with them accordingly.

BLACK LEG.

Four farmers near Maxville, Ont., had lost seven young cattle with this disease, four at one farm and one calf each at three neighbouring farms.

Two calves died near Sherbrooke, P.Q., of the same disease.

In some of these cases the carcasses were partially consumed and scattered about by crows and dogs, so that it was impossible to satisfactorily carry out necessary sanitation and disposal of the carcasses by burning or deep burial in lime.

ACTINOMYCOSIS.

Acting on instructions, I went to Prescott, Ont., to be present at the slaughtering of six steers affected with this disease belonging to Messrs. Gordon & Ironsides, which were rejected by the inspectors at Montreal for exportation, and were shipped back there.

Five were found fit for food on post mortem examination, the disease being confined to the maxillary bones. The other one had general tuberculosis, and the carcass was condemned as unfit for food.

HOG CHOLERA.

An outbreak of supposed hog cholera was reported at Oshawa, Ont. I found on examination, however, that it was not the disease, but a rheumatic condition due to local causes. I made a post mortem of one little pig and found no lesions of hog cholera.

OTHER DISEASES.

I beg to call your attention to the necessity of trying to get farmers who lose animals from disease supposed to be contagious to notify us at once, so that we be given an opportunity of making a post mortem examination to determine the actual nature of the disease. On several occasions I have been unable to make either a clinical or post mortem investigation, having to depend on the verbal reports given me, which are not always reliable or accurate.

I have the honour to be, sir,
Your obedient servant,

A. E. MOORE,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 15.

CATTLE QUARANTINE.

(M. C. Baker, D.V.S.)

Montreal, November 19, 1900.

Sir,—I beg to report that during the year ended October 31, 1900, I have inspected and passed for shipment, at the Canadian Pacific stock yards, 48,643 head of cattle and 13,240 sheep. Of these, 909 head of cattle were from the United States, the balance of the cattle and all the sheep were Canadian.

There were rejected as unfit to ship seventy-three head of cattle and six sheep; of the cattle, three were rejected for actinomycosis. The balance were lame or injured in the cars. The unusual large number rejected on account of injuries was due to the fact that a collision occurred near Montebello, in which several cars loaded with stock for export were derailed and some were overturned.

There is a noticeable diminution in the number of cases of actinomycosis, which gives reason to hope that in a short time this disease will be entirely eradicated.

A very large proportion of the cattle passing through the Canadian Pacific stock yards are from Manitoba and the North-west Territories, mostly ranch cattle, and it is gratifying to be able to report that these cattle were, on the whole, in much better condition than those of previous years.

The monthly shipments are as follows :—

	Cattle.	Sheep.
November, 1899	5,113	2,218
May, 1900	2,764	386
June	4,959	2,205
July	7,049	2,436
August	9,565	1,684
September	10,699	3,171
October	8,494	1,140
Total	48,643	13,240

The whole is respectfully submitted.

I have the honour to be sir,
Your obedient servant,

M. C. BAKER,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 16.

CATTLE QUARANTINE.

(Chas. McEachran, D.V.S.)

Montreal, November 26, 1900.

Sir,—I have the honour to report that during the year commencing November 1, 1899, and ending October 31, 1900, 2,997 horses have been inspected by me, and exported from the port of Montreal to Great Britain. Forty-seven horses were held back on account of being slightly affected by a contagious and infectious disease, viz. :—Forty-three from influenza, and four from strangles.

I have the honour to be sir,
Your obedient servant,

CHAS. McEACHRAN,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 17.

CATTLE QUARANTINE.

(B. A. Sudgen, D.V.S.)

Montreal, November 19, 1900.

Sir,—I have the honour to report to you the number of cattle and sheep that have been inspected and passed for shipment at the Grand Trunk Railway stock yards, Montreal, during the season extending from November 1, 1899, to October 31, 1900.

	Cattle.		Sheep.	
	Canadian.	U. States.	Canadian	U. States.
November, 1899	1,150	.....	4,380	.....
May, 1900	8,098	554	527	1,407
June, "	7,322	1,792	2,056	631
July, "	6,736	853	3,624	.....
August, "	5,516	682	1,596	.....
September, "	2,442	439	3,934	45
October, "	2,422	638	3,297	.....
Total, Canadian cattle	33,686	4,958	19,408	2,083
" U. S. "	4,958		2,083	
Total cattle	38,644		21 491	

During the season thirty-three cattle were rejected, six on account of actinomycosis, and twenty-seven owing to injuries received during transportation. Thirty-five sheep were rejected for various reasons.

Acting upon orders received from the department by Prof. Baker with regard to the outbreak of foot and mouth disease in South America, I personally attended to the cleansing and disinfection of all vessels which had during the winter of 1899-1900 been engaged in carrying live stock from South American ports to Great Britain.

As the disease also broke out in England and Wales, special attention was paid to the cleansing of vessels intending to load cattle in this port which had brought live stock from British ports to the quarantine at Lévis. In each case after the cattle spaces had been thoroughly washed down they were sprayed with a strong solution of crude carbolic acid, and if it had not been previously done, they were then whitewashed.

I have the honour to be, sir,
Your obedient servant,

B. A. SUDGEN,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 18.

REPORT ON POINT LEVIS CATTLE QUARANTINE STATION.

(J. A. Couture, D.V.S.)

Quebec, November 2, 1900.

Sir,—I have the honour to herein inclose my yearly report of the Pointe Lévis Cattle Quarantine.

There were imported during the last twelve months :

508 head of cattle, 1,063 sheep, 15 pigs, two horses.

Classified by breeds the above stock is divided as follows :—

	Cattle for Canada.	Cattle for the United States.
471 Shorthorns	406	65
19 Ayrshires	19	..
14 Cotentines	...	14
2 Kerries	2	..
1 Hereford	...	1
1 Galloway	...	1
	427	81

Being 427 head for Canada and 81 for the United States.

	Sheep for Canada.	Sheep for United States.
358 Rambouillet	306	52
343 Shropshires	333	10
100 Hampshires	52	48
83 Lincolns	79	4
65 Oxfords	34	31
45 South Downs	10	35
39 Cotswolds	39	...
20 Dorsets	10	10
10 Leicesters	10	...
Total	873	190

	Pigs for Canada.	Pigs for United States.
15 Yorkshires	13	2

16 calves were born in quarantine ; 2 calves, 1 cow, 2 sheep died in quarantine ; 31 head of cattle were tested with tuberculine, 12 of which reacted.

I have the honour to be, sir,
Your obedient servant,

J. A. COUTURE, D.V.S.,
Assistant Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

POINT LEVIS CATTLE QUARANTINE, OCTOBER 31, 1900.

STATEMENT of Swine Imported at Lévis Quarantine, 12 months ended October 31, 1900.

July 22	S. S. Etolia	12	Yorkshire	Jos. Fetherstone, Streetsville, Ont.	Discharged Aug. 11	15
Aug. 2	" Lycia	1	"	" " "	" " 11	
" 10	" Tritonia	2	"	N. P. Clark, St. Cloud Minn., U.S.	" Oct. 29	

J. A. COUTURE, D.V.S.
Assistant Inspector.

64 VICTORIA, A. 1901

STATEMENT of Sheep Imported at the Lévis Cattle

Date of Arrival.	Steamer.	Line.	From.	Ramboullets.			Shropshires.			Hampshires.			Lincoln.			Oxfords.		
				Ram.	Ewe.	Total.	Ram.	Ewe.	Total.	Ram.	Ewe.	Total.	Ram.	Ewe.	Total.	Ram.	Ewe.	Total.
1899.																		
Nov. 11	Montcalm	El. Dempster.	Bristol				2	41	43									
" 11	"	"	"					10	10									
" 11	"	"	"															
" 23	Ardoni	"	London								20	20						
" 23	"	"	"											39	39			
1900.																		
May 16	Westphalia	Americ'n Ham	Hamburg.	31	187	218												
" 16	"	"	"	11	59	70												
" 17	Lakonia	Donaldson	Glasgow													2	6	8
July 5	Westphalia	Americ'n Ham	Hamburg.	9	9	18												
" 9	Armage	El. Dempster.	London				12	38	40							2		2
" 19	Degama	"	Bristol															
" 19	"	"	"													4	10	14
" 19	"	"	"				1		1	2		2	1	2	3	19	12	31
" 22	Etolia	"	"							5	2	7	1		1			
" 26	Lakonia	Donaldson	Glasgow				46	77	123	7	25	32	2	15	17	4	6	10
" 30	Montford	El. Dempster.	Liverpool										9	14	23			
Aug. 2	Lycia	"	Bristol				16	90	106									
" 14	Memnon	"	"				20		20	10		10						
" 14	"	"	"															
" 14	"	"	"															
" 14	"	"	"															
" 14	"	"	"															
" 14	"	"	"								2	2						
" 14	"	"	"															
Sept. 4	Teutonia	Am. Ham	Hamburg.	32		32												
" 4	"	"	"	19	1	20												
" 6	Montevidio	Allan.	London							1	20	21						
Oct. 13	Lake Champlain	El. Dempster.	Liverpool.							6		6						
				102	256	358	97	256	343	31	69	100	52	31	83	31	34	65

SESSIONAL PAPER No. 15

Quarantine, Twelve Months ended October 31, 1900.

South-down.			Cots-wold.			Dorset.			Lei-cester.			Grand Total.	Owner.	Address.	Date of Sailing.	Date of Discharge.
Ram.	Ewe.	Total.	Ram.	Ewe.	Total.	Ram.	Ewe.	Total.	Ram.	Ewe.	Total.					
															1899	1899
												43	W. S. Hawkshaw	Glenworth, Ont	Oct. 30	Nov. 27
												10	Geo. Allen	Allerton, Ills	" 30	" 27
												19	A. W. Smith	Maple Lodge, Ont	" 30	" 27
									4	6	10	20	Hon. W. H. Cochran	Hillhurst, Que	" 31	Dec. 7
												39	J. Patrick	Ilderton, Ont	" 31	" 7
															1900	1900
												218	Robt. Miller	Stouffville, Ont	Apl 28	May 30
												70	W. S. Hawkshaw	Glenworth, Ont	" 28	" 30
												8	H. Cargill & Son	Cargill, Ont	May 5	" 30
												18	Robt. Miller	Stouffville, Ont	June 19	July 19
			1	2	3							45	John Campbell	Woodville, Ont	" 24	" 23
1	3	4										4	T. C. Douglas	Galt, Ont	July 4	Aug. 6
												14	H. Arkell	Arkell, Ont	" 4	" 6
5	6	11				3	7	10				58	Geo. McKerrow	Sussex, Wis	" 4	" 6
												8	Wm. Newton	Pontiac, Mich	" 11	" 6
			17	19	36	1	3	4				222	Robt. Miller	Stouffville, Ont	" 14	" 8
												23	J. H. Patrick	Ilderton, Ont	" 23	" 13
												106	W. C. Edwards & Co	Rockland, Ont	" 19	" 15
												30	John Sparks	Reno, Nevada	" 29	" 28
2		2										2	Hon. G. A. Drummond	Beaconsfield, P.Q.	" 29	" 28
2	2	4										4	Geo. Allan	Allerton, Ill	" 29	" 28
							3	3				3	G. McGillvery	Uxbridge, Ont	" 29	" 28
							3	3				3	R. H. Harding	Thorndale, Ont	" 29	" 28
												2	P. W. Artz	New Carlisle, Ohio	" 29	" 28
1	2	3										3	Abram Renick	Seymore, Ky	" 29	" 28
												32	Geo. Harding & Son	Waukshaw, Wis	Aug. 20	Sept. 19
												20	D. Lincoln	Milford Centre, Ohio	" 20	" 19
1	20	21										42	Dr. Webb	Shelburn, Vt	" 24	" 20
												6	J. G. Massey	Fort Logan, Col	Oct. 4	Oct. 30
12	33	45	18	21	39	4	16	20	4	6	10	1,063				

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STATEMENT of Cattle Imported at the Lévis Cattle Quarantine,

Date of Arrival.	Steamer.	Line.	From.	Shorthorn.				Ayrshire.				Contentine.				Dexter Kerry.				Hereford.			
				Bulls.	Cows.	Calves.	Total.	Bulls.	Cows.	Calves.	Total.	Bulls.	Cows.	Calves.	Total.	Bulls.	Cows.	Calves.	Total.	Bulls.	Cows.	Calves.	Total.
1899.																							
Nov. 2.	Kastolia	Donaldson	Glasgow			6	6																
" 2.	"	"	"		17	9	26																
" 2.	"	"	"		12	4	16																
1900.																							
May 16.	Lakonia	"	"	5	46	1	52																
" 16.	"	"	"	7	2	1	10																
" 17	Pomeranian	Allan	"					2	14	3	19												
" 31.	Tritonia	Donaldson	"	6	45	17	68																
July 26.	Lakonia	"	"	3	40	13	56																
" 26.	"	"	"	1	34	6	41																
" 31.	Mont Blanc	France Can.	Havre									2	12	14									
Aug. 3.	Amarynthia	Donaldson	Glasgow	1	12	5	18																
" 3.	"	"	"	3	8	1	12																
" 10.	Tritonia	"	"	3	18	6	27																
" 10.	"	"	"		18	6	24																
" 10.	"	"	"	5	18	6	29																
" 14.	Mennon	El. Dempster.	Bristol																	1			1
" 14	"	"	"													2		2					
Sept. 6.	Amarynthia	Donaldson	Glasgow		19		19																
" 6	"	"	"		5	3	8																
" 6	"	"	"	1		1	2																
" 14.	Tritonia	"	"		7	9	16																
Oct. 10.	Etolia	El. Dempster.	Bristol		5		5																
" 20.	Tritonia	Donaldson	Glasgow		2	1	3																
" 20.	"	"	"	2	1	1	4																
" 20.	"	"	"		6		6																
" 20.	"	"	"		17	6	23																
				37	352	82	471	2	14	3	19	2	12	14		2		2	1				1
																				Born in quarantine...			
																				Grand total..			

twelve months ended October 31, 1900.

Galloway.				Grand Total.	Owner.	Address.	Date of Sailing.	Date of Discharge.	Born in Quarantine.	Died in Quarantine.
Bulls.	Cows.	Calves.	Total.							
							1899	1900.		
				6	John Mills & Son	Brougham, Ont	Oct. 20	Jan. 17		
				26	H. Cargill & Son	Cargill, Ont	" 20	" 17		
				16	W. C. Edwards	Rockland, Ont	" 20	" 17	3	
							1900.			
				52	H. Cargill & Son	Cargill, Ont	May 5	Aug. 1		
				10	Robert Miller	Stouffville, Ont.	" 5	" 1		
				19	W. W. O'Gilvie	Lachine, Que	" 5	" 1		
				68	W. G. Pettit	Freeman, Ont	" 18	" 15	1	
				56	Robt. Miller	Stouffville, Ont.	July 14	Oct. 12	5	1 calf.
				41	John Isaac	Markham, Ont	" 14	" 12	1	2 cows & c.
				14	H. R. C. Watson	Brandon, Vt	June 18	Sept. 20	1	
				18	N. A. Lind	Rolfe, Iowa	July 21	Oct. 20	1	
				12	M. E. Jones	Willimsville, Ills	" 21	" 20	1	1 calf.
				27	Art. Johnson	Greenwood, Ont	" 28	" 26	1	
				24	W. C. Edwards	Rockland, Ont	" 28	" 26	1	
1			1	30	N. P. Clark	St Cloud, Minn	" 28	" 26		
				1	John Sparks	Reno, Nevada	" 29	" 30		
				2	Hon. G. Drummond	Beaconsfield, Que	" 29	" 30		
				19	H. Gargill & Son	Cargill, Ont	Aug. 25		1	
				8	S. Nichl	Sylvian, Ont	" 25			
				2	Art. Johnston	Greenwood, Ont	" 25			
				16	Wm. Linton	Aurora	Sept. 1			
				5	W. R. Nelson	Kansas City, Ind.	" 27			
				3	H. Cargill & Son	Cargill, Ont	Oct. 6			
				4	Thos. Russell	Exeter, Ont	" 6			
				6	Chas. Rankin	Wyebrige, Ont	" 6			
				23	Geo. Isaac	Cobourg, Ont	" 6			
1			1	508					16	4
				16						
				524						

J. A. COUTURE, D.V.S.,
Assistant Inspector.

No. 19.

REPORT ON ST. JOHN CATTLE QUARANTINE STATION.

(J. H. Frink, D.V.S.)

St. John, N.B., November 1, 1900.

Sir,—I have the honour to submit my annual report concerning the work done at this station during the year.

Imports.—A large number of cattle, sheep, swine and horses have been imported through this port from Great Britain, careful inspection having been made on shipboard, before permission was given to land, on account of the prevalence of foot and mouth disease in certain districts of Great Britain. The usual term of quarantine was enforced, ninety days on cattle and fifteen days for sheep and swine. Horses, on examination, having been found healthy, and accompanied with the necessary health certificates, were allowed to proceed. No contagious disease manifested itself in any of the animals imported. It will be absolutely necessary to extend the facilities now existing for the purpose of quarantine, so that in the event of contagious disease breaking out in quarantine, it could be effectually controlled.

Exports.—The export of cattle and sheep to Great Britain nearly doubled the past year. Very few animals were condemned. The practice of sending cattle for export affected with actinomycosis has been discontinued, and very few animals have been injured in transit. The cattle yards are kept and maintained in a wretched condition, notwithstanding repeated protests made to the railway authorities, and I believe that more injury and loss is inflicted at these places, in a single large shipment, than would place the yards in a fairly decent state of repair. Bad treatment before being placed on shipboard, together with the consequences of a sea voyage, inevitably tend to a depreciation in value to the shipper, and the reputation of the producer must also suffer.

Tuberculosis.—The testing of cattle for tubercle has not been prosecuted with as much vigour as in previous years, owing, in some measure, to the relaxation of local laws governing the sale of milk. The total number tested was 167. Six animals were found diseased. As a result of observation there appears to be a better feeling towards the tuberculine test among the breeders of pure-bred stock, and those who have herds entirely free show much reluctance in allowing an untried animal to mix with their own, and if this feeling is maintained, there can be little doubt that the expression pure bred and tuberculous will cease to be applied and lose its significance.

Anthrax.—Two outbreaks of anthrax were observed during the year, one in King's County, affecting not only cattle but swine. The cause in one case was traced directly to water drawn from a well, which had not been used for some years. The usual source of supply, a running stream, had been suddenly and firmly frozen over. In each case the bacillus anthrax was stained and identified microscopically. The carcasses were destroyed and the premises disinfected.

Other Inspections.—An inspection was made of the ss. *Fashoda*, chartered to carry hay and fodder to South Africa for war purposes, this vessel having carried on the previous voyage cattle from the Argentine Republic, then an infected country. The vessel having been stripped of all wood-work, stanchions, stalls and fittings on the

other side, and disinfected off the coast of Great Britain, together with the fact that no cattle were loaded below decks, loading was proceeded with.

I have the honour to be sir,
Your obedient servant,

JAMES H. FRINK,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

CATTLE, HORSES AND SHEEP EXPORTED FROM ST. JOHN, N.B., WINTER 1899-1900.

Canadian Cattle.	Canadian Sheep.	U. S. Cattle.	U.S. Horses.	Canadian Horses.	Geldings.	Mares.	Carriage.	Draft.	Sheep Condemned.	Cattle Condemned.	Total
12,255	2,911	3,216	72	413	315	98	166	247	3	*	19,693

Three head of cattle were condemned for injuries received in transit; one animal with actinomycosis, one horse detained with strangles, and three sheep condemned with 'scab.'

IMPORTS—HORSES FROM GREAT BRITAIN.

Name of Importer.	Address.	Steamship.	From.	Breed.	Stallions.	Total.
Joseph Watson	Lincoln, Neb	Monterey	Liverpool	Shires	12	19
Dalgetty & Co	London, Ont.	Amarynthia	Glasgow	Clydesdale	2	
James Moffat	Teeswater, Ont.	"	"	"	5	

IMPORTS—BREEDING CATTLE FROM UNITED STATES.

Name.	Address.	Via.	Breed.	Cattle.	Sheep.	Total.
W. McMonagle	Sussex Vale, N.B.	Intern. St'hip.	Guernsey	2		3
D. Killen	Petitcodiac, N.B.	C.P.R.	Leicester		1	

CATTLE TESTED FOR TUBERCULOSIS DURING YEAR.

Number of Cattle Tested.	Re-acted.	Diseased on Post Mortem.	Class.	Females.	Males.
167	6	6	Grade Ayrshires&Jerseys	5	1

PORT OF ST. JOHN.

Total Number Imported from November 1, 1899, to November 1, 1900.

Date of Arrival.	Steamer.	Line.	Sailing From	Cattle.					Sheep.			
				Bulls.	Cows and Heifers.	Calves	Total.	Breed.	Rams.	Ewes.	Total.	Breed.
1899.												
November 19...	S.S. Alcedes...	Donaldson	Glasgow	4	14		18	Shorthorns				
1900.												
March 3	SS. Amarynthia	Donaldson	Glasgow	1	16	2	19	Ayrshires		36	36	Suffolk Down & Shrops
" 14	SS. Lake Huron	Elder Dempster	Liverpool									
" 17	SS. Concordia	Donaldson	Glasgow	6	42	6	54	Shorthorns				
" 29	SS. Lake Superior	Elder Dempster	Liverpool	15	2		17	Galloways & Hereford				
" 29	" "	" "	"	2	1		3	Sussex				
April 22	SS. Lake Huron	" "	"	2			2	Galloway				
July 3	SS. Ocamo	Pickford & Black	Glasgow	1	1		2	Polled Angus				

Swine.				Grand Total.	Names of Owners.	Residence.	Date of Sailing.	Discharged.	Born in Quarantine.	Dead in Quarantine.	Name of Disease.
Boars	Sows.	Total.	Breed.								
.....	.....	.....	.....	18	W. H. Cochrane.....	Hillhurst, P. Q.....	Nov. 4....	Feb. 3....	.....	.....	*Diseases incidental to parturition, aggravated by sea voyage. †Diarrhœa.
.....	.....	.....	.....	19	Robert Reford.....	Montreal, P. Q.....	Feb. 10....	May 11...	5	.....	
.....	.....	.....	.....	36	Thomas Bradshaw.....	Danville, P. Q.....	March 2....	Mar. 29...	*9	.....	
9	.....	.....	Improved York...	63	W. D. Flatt.....	Hamilton, Ontario..	" 3....	May 30....	2	*8 †2	
.....	.....	.....	.....	17	D. H. Andrews.....	Crane Lake, N.W.T.	" 17....	June 21...	.....	.....	
.....	.....	.....	.....	3	A. L. D'Enycourt.....	Calgary, N.W.T....	" 17....	" 21....	.....	.....	
.....	.....	.....	.....	2	Little Bow Riv'r Cat'le Co	High River, Alberta	April 8....	July 20....	.....	.....	
.....	.....	.....	.....	2	W. H. Stairs.....	Hillaton, N. S ...	June 22....	Sept. 28 ...	.....	.....	
				162							

No. 20.

REPORT ON HALIFAX, N.S., CATTLE QUARANTINE STATION,

(Wm. Jakeman, D.V.S.)

Halifax, October 31, 1900.

Sir,—I beg leave to submit my annual report on cattle quarantine at the port of Halifax, from November 31, 1899, to October 31, 1900.

On November 17, 1899, I received a letter from the Secretary of the Department of Agriculture, advising me to go to George White, Esq., of Grafton, King's County, and apply the tuberculin test on his cattle, which I did on the 28th, with results as per charts sent to the department.

On November 18, 1899, I received a letter from the Secretary of the Department of Agriculture, requesting me to apply the tuberculin test to the cattle of the Mount Hope Asylum, which was done, with results as per chart sent to the department.

On September 5, 1900, I received a letter from the secretary of the Department of Agriculture, requesting me to apply the tuberculin test to the cattle of J. R. Starr, Esq., King's County ; Graham Creighton, Esq., Halifax ; J. J. McDougall, Esq., Glace Bay, C.B.; P. J. Petrie, Esq., Glace Bay, C.B.; Hiram Donkin, Esq., Glace Bay, C.B. Also, the cattle of Dr. R. A. H. MacKeen, Glace Bay, C.B.; D. Burchell, Esq., Glace Bay, C.B.; J. R. Blackett, Esq., Glace Bay, C.B.; P. Farrell, Esq., Glace Bay, C.B., which I did, with results as per chart sent to the department.

EXPORTED.

November 2, 1889.—Per ss. *Duart Castle*, of P. & B. Line, to West Indies, 25 sheep and 1 pig.

November 9, 1899.—Per ss. *Pro Patria*, one horse to Newfoundland.

November 15, 1899.—Per ss. *Beta*, of P. & B. Line, to West Indies : three cattle, two horses.

November 30, 1899.—Per ss. *Taymouth Castle*, of P. & B. Line, to Bermuda : ten cattle, ninety-eight sheep, eleven horses.

December 15, 1899.—Per ss. *Beta*, of P. & B. Line, to West Indies : two cows.

January 15, 1900.—Per ss. *Pro Patria*, French line to St. Pierre, Newfoundland : two cows.

February 23, 1900.—Per ss. *Duart Castle*, of P. & B. Line, to Bermuda : sixty-one sheep.

March 27, 1900.—Per ss. *Scotsman*; the property of Leinster Regiment, for England : four horses.

March 29, 1900.—Per ss. *Pro Patria*, French line to St. Pierre, Newfoundland : ten cows, two sheep.

April 30, 1900.—Per ss. *Pro Patria*, French line to St. Pierre, Newfoundland : one horse.

May 15, 1900.—Per ss. *Beta*, of P. & B. Line, to Bermuda : three cows.

May 28, 1900.—Per ss. *Pro Patria*, French line to St. Pierre, Newfoundland : one horse.

June 21, 1900.—Per ss. *Scotsman*, to England : two horses, two dogs, the property of General Lord Seymour, Leinster Regiment.

July 14, 1900.—Per ss. *Beta*, of P. & B. Line, to Jamaica : three cows, fifty-five sheep, five horses.

August 11, 1900.—Per ss. *Orinoco*, of P. & B. Line, to West Indies : fifty sheep.

August 15, 1900.—Per ss. *Taymouth Castle*, of P. & B. Line, to West Indies : six sheep, three pigs.

September 10, 1900.—Per ss. *Ocaino*, of P. & B. Line, to West Indies : two cows, thirty-five sheep, two horses.

September 15, 1900.—Per ss. *Beta*, of P. & B. Line, to Jamaica : seven sheep.

October 8, 1900.—Per ss. *Orinoco*, of P. & B. Line, to Jamaica : two horses, four cows, eighty-five sheep, one pig.

October 15, 1900.—Per ss. *Beta*, of P. & B. Line, to Bermuda : seven horses, fifteen sheep, six cows, four calves.

I have the honour to be sir,
Your obedient servant,

W. JAKEMAN,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 21.

REPORT ON HEALTH OF LIVE STOCK IN ONTARIO.

(Andrew Smith, F.R.C.V.S.)

Toronto, October 31, 1900.

Sir,—I have the honour to submit the following report on the health of the domestic animals in the province of Ontario during the past year.

HORSES.

The general health good and a marked increase in their general value. Strangles and influenza existed to a certain extent more particularly among horses in cities. Two outbreaks of glanders were reported, one by Mr. F. Bryant, veterinary inspector, Sunderland, where five horses were destroyed, and another by Mr. S. E. Boulter, veterinary inspector, Niagara Falls, South. Both cases have been already reported to the department.

CATTLE.

Throughout the province cattle have been generally healthy. Of the fat cattle passing through the market, in the city of Toronto during the past year that were held as suspicious, and butchered under veterinary inspection, only a few cases have been condemned as tuberculous, these cattle are(as a rule, young, fat and vigorous.

SHEEP.

A severe outbreak of sheep-scab occurred at Mr. Bentley's farm in Whitchurch. These sheep came from Wyoming, United States. I do not think the disease spread from the farm. This outbreak was reported to the department in March.

A number of cases were reported in the district of Woodville. Mr. Gerrow, veterinary inspector, reports the disease is now under control.

SWINE.

No cases of hog cholera have been reported in this district.

I have the honour to be, sir,
Your obedient servant,

ANDREW SMITH, F.R.C.V.S.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 22.

REPORT ON POINT EDWARD CATTLE QUARANTINE STATION.

(Arthur Brown, D.V.S.)

Sarnia, October 31, 1900.

Sir,—I have the honour to submit my report of cattle and swine received into the Ontario cattle quarantine at Point Edward (from November 1, 1899, to October 31, 1900. The swine imported were of good quality, a preference being shown for white Chesters.

There has been no diseased animals in the quarantine this year, and I may state that no contagious disease exists in this district, with the exception of some cases of tuberculosis and actinomycosis.

Attached you will find a detailed statement of the animals received into quarantine, also cattle that were imported for breeding purposes that did not require to be placed in quarantine during this period.

I have the honour to be, sir,
Your obedient servant,

ARTHUR BROWN, V.S.,
Inspector.

STATEMENT of Cattle received into the Ontario Cattle Quarantine at Point Edward from November 1, 1899, until October 31, 1900, also cattle that were imported for breeding purposes, having the necessary tuberculin test and health certificates, also cattle forming part of the settler's effects.

Date of Entry.	Durhams.		Holsteins.		Galloways.		Jerseys.		Common Bred.		Valuation.	Removal.	Consignee and Address.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			
1899.											$ cts.	1899.	
December 6								1			50 00	December 13	Geo. Primmer, Petrolea, Ont.
" 15					1	2					700 00	" 15	D. McCrae, Guelph, Ont.
1900.												1900.	
January 19	1	1									1,000 00	January 19	F. D. Flatt, Hamilton, Ont.
" 24			1								50 00	February 1	H. Bollert, Stratford, Ont.
March 15										5	125 00	March 15	Thos. Brush, Warwick, Ont.
April 9										2	60 00	April 9	D. Ickler, Wiarton, Ont.
June 5										1	35 00	June 5	Peter Laird, Port Arthur, Ont.
August 10	2	5									1,000 00	August 10	W. D. Flatt, Hamilton, Ont.
" 21	2										300 00	" 21	Robt. Miller, Stouffville, Ont.
October 16										4	120 00		A. P. Wilcocks, Arkona, Ont.
Total	5	6	1		1	2		1		12	3,440 00		

Total number of cattle, 28.

REPORT of Swine received into the Ontario Cattle Quarantine at Point Edward from November 1, 1899, until October 31, 1900.

Date of Entry.	White Chesters.	White Chesters.	Poland China.	Poland China.	Berkshire.	Berkshire.	Essex.	Essex.	Date of Removal.	Value.	Consignee and Address.
1899.	M.	F.	M.	F.	M.	F.	M.	F.	1899.	$ cts.	
Nov. 10..	....	....	....	..	....	....	1	....	Nov. 25..	15 00	Mrs. J. T. Maynard, Mission, B.C.
" 10..	....	....	1	....	....	....	....	....	" 25..	30 00	Meredith & Dunlop, Thorncliffe, O.
" 16..	....	....	....	1	..	. .	....	....	Dec. 1..	10 00	" Dresden, Ont.
Dec. 8..	1	1	....	....	....	....	....	....	" 22..	35 00	Jno. B. Stevenson, St. Thomas, Ont.
1900.											
June 6..	....	....	....	....	1	....	..	....	June 21..	25 00	W. A. Shields, Milton, Ont.
" 28..	1	1	....	....	..	....	....	....	July 13..	40 00	G. H. Callbeck, Summerside, P.E.I.
July 11..	1	1	....	....	....	....	....	....	" 26..	40 00	J. D. Deeks, North Williamsb'g, O.
" 18..	1	1	....	....	....	....	....	....	Aug. 2..	40 00	Anson McCabe, Mt. Wolfe, Ont.
Aug. 1..	1	1	....	....	....	....	....	....	" 16..	40 00	Rich. Hamon, Aurora, Ont.
" 15..	1	....	....	....	....	..	....	....	" 30..	25 00	Joe James, Orillia, Ont.
" 29..	1	....	....	....	....	....	....	....	Sept. 13..	25 00	Jos. Henshaw, London, Ont.
Sept. 19..	....	....	....	....	1	..	....	....	Oct. 4..	40 00	H. Bennett & Son, St. Williams, Ont.
April 6..	....	....	.	....	....	1	....	....	April 6..	20 00	M. B. Hill, Stouffville, Ont. (settler).
Total.	7	5	1	1	2	1	1	....		385 00	

Total, 18.

I examined seventy-six horses and twenty-two sheep and found them free from any infectious or contagious diseases.

ARTHUR BROWN, V.S.,

Inspector.

No. 23.

REPORT ON HOG CHOLERA OR SWINE PLAGUE IN SOUTH ESSEX. ONT.

(M. B. PERDUE, V.S)

KINGSVILLE, November 16, 1900.

SIR,—I beg to report that during the year ended October 31, 1900, my duties in South Essex have been chiefly confined to the inspection of localities infected with swine plague.

The following is a statement by months of hogs slaughtered for this cause :—

Date.	Owner.	Diseased Hogs.	Contact Hogs.	Amount of Indemnity.
1899-1900.				$ cts.
November 9	G. M. Thornton	6	14	82 00
February 17	Levi Mitchell	3	6	26 50
" 24	Hermand Bertrand	26	5	81 08
March 9	D. C. Decare	19	11	113 75
May 26	Albert Burns	4	2	17 00
June 4	Amon Noble	2	9	47 08
" 9	Albini Lucier	8	5	76 92
September 11	Chas. Renaud	7	5	81 00
" 11	Ephriam Renaud	10	34	227 17
" 15	David Kennedy	6	15	84 58
" 24	Dr. McBride	20	22	216 33
" 24	Jno. Gibb	32	20	231 25
" 24	Jas. Lafferty	24	22	190 82
" 28	Fred. Mickle	7	13	94 67
" 28	Curtis Mickle	10	20	191 00
October 8	Augustus St. Onge	5	17	71 67
" 8	Antoine Beaudoin	8	14	94 42
" 11	Jno. P. Deneau	4	4	16 25
" 11	Jas. Shay	2	0	4 00
" 15	Chas. Sawyer	4	10	29 17
" 15	Thos. Goodchild	10	19	81 50
" 15	Francis Goodchild	2	26	136 50
" 24	J. H. Beaudoin	6	1	29 25
" 30	J. S. Patton	10	27	173 33
" 30	Jno. Park	9	26	209 17
" 30	Levi Wright	9	16	93 42
	Total outbreaks, 26	253	363	2,699 83

In addition to the above cases, I have inspected a large number of farms where the disease was suspected to exist by the owner or others, a number of these were quarantined for a short time on suspicion.

In every case where swine plague existed all hogs diseased and in contact were slaughtered at once, and the premises quarantined and directions given for disinfection.

I would call your attention to the fact that the recent severe outbreak has been confined to a line of farms fronting on the Detroit River, owned by some of the most extensive hog raisers in western Ontario.

The premises in most cases were dry and clean, and the hogs well housed and cared for. A number of the hogs slaughtered were very valuable, having registered pedigrees.

In Wayne County, and in many of the townships across the river in Michigan swine plague has been prevalent and recently has been very severe. At this part of the river the current sets in towards the Canadian shore, and as there is always considerable offal washed up, that has been thrown into the river from either side, it is quite probable that the infection came from this source.

Beginning at Messrs. Ephriam and Chas. Renaud, in Malden township, the disease next appeared on the adjoining farm to the south, and then followed the river front in a direction opposite to the current, taking in nineteen farms, in a distance of four or five miles. On many of the farms the hogs had access to the river bank, and on no other farms except those having river front did the disease appear.

The present regulations with regard to quarantine and disinfection when faithfully carried out have proved very effective.

For over three years I have not found a single instance where a second outbreak has taken place on disinfected premises after the quarantine had been removed, although in almost every case the farmers have again taken up the raising of hogs.

In each yearly report there is a steadily increasing proportion of contact hogs slaughtered as compared with diseased hogs. This is owing to the fact that the farmers are learning that it is to their own interest to report the cases on the first appearance of the disease. This is an advantage both ways. The owner receives a three-fourths valuation on a majority of his hogs for which he would have only realized one-third value had he delayed and allowed them to become infected, and it enables me to deal with the attack early and prevent it spreading to other parts of my district.

Of actinomycosis there were three cases among cattle.

I have the honour to be, sir,
Your obedient servant,

M. B. PERDUE, V.S.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 24.

REPORT ON HOG CHOLERA OR SWINE PLAGUE IN THE COUNTY OF KENT, ONT.

(Jos. Kime, Jr., V.S.)

Chatham, October 31, 1900.

Sir,—I beg to submit my annual report in connection with contagious diseases in animals in the vicinity of the city of Chatham, county of Kent.

1899.

November 1.—Visited farm and premises of R. Cummings, township of Chatham, and slaughtered hogs for swine plague.

November 2.—Visited premises of R. Cummings to inspect fat hogs as slaughtered.

November 7.—Visited farm of Wm. Nollies, township of Chatham, and slaughtered hogs for swine plague ; sixteen diseased and four in contact.

November 15.—Visited farm of John Vincents to inspect and slaughter nine diseased hogs and fifteen in contact.

November 20.—Visited farm and premises of Alex. Kennedy, Dover township, and slaughtered hogs for swine plague.

November 21.—Visited Alex. Kennedy's, and inspected fat hogs as slaughtered.

November 23.—Visited the farm of W. J. Wilcox and Russel Pharell, Chatham township, as to cleansing and disinfecting of premises, removal of quarantine, &c.

November 28.—Visit to inspect hogs as to disease on farm of Frank Stocks, Dover township. Disease not contagious.

November 30.—Visit to inspect farms of Samuel Timmerman, William Johnson, Robert Cummings and J. Vincent as to cleansing and disinfecting, removal of quarantine, &c.

December 6.—Visited farm and premises of T. S. Purdy, inspected hogs and slaughtered twenty diseased and fifteen in contact.

December 12.—Visited R. A. Cummings and J. Vincents to remove quarantine.

December 15.—Visited William Noltus and Geo. Green, as to cleansing and disinfecting of premises, removal of quarantine, &c.

December 19.—Visit to remove quarantine off farm of Alex. Kennedy, Dover township.

December 20.—Visit to inspect and slaughter hogs on farm of J. R. Longmore, of the township of Raleigh.

December 22.—Visit to inspect and quarantine hogs on the premises of Thomas Montgomery, Raleigh township.

December 26.—Visit to slaughter hogs for swine plague on the farm of Thomas Montgomery; also, quarantined hogs and farm of William Montgomery, Raleigh township.

December 29.—Visit to inspect hogs on premises of Matthew Dillon, Raleigh township. Hogs free from disease.

1900.

January 6.—Visit to inspect hogs on premises of Stephen Keiver and Geo. Duff's slaughter house, Harwich township.

January 8.—Visit to slaughtered hogs on farms of Geo. Duff and S. Keiver.

January 9.—Visit to slaughter hogs on farm and premises of S. Fisher, Harwich township, for swine plague; quarantined farm, &c.

January 15.—Visited and inspected farm and premises of Thomas S. Purdy, of Tilbury East township, as to cleansing and disinfecting, removal of quarantine, &c.

January 26.—Visit to farms of J. R. Longmore and Thomas Montgomery, as to cleansing and disinfecting.

March 2.—Visit to inspect and slaughter hogs for swine plague on farm and premises of R. J. Parks, township of Chatham.

March 7.—Visit to inspect and slaughter hogs on premises of John Solomon, township of Chatham.

March 12.—Visit to inspect hogs on premises of H. Morgan, township of Chatham. Disease not contagious.

March 29.—Visit to remove quarantine from premises of A. Evans and Samuel Fisher, Horwich township.

May 2.—Visit to remove quarantine from the premises of Stephen Keiver, township of Horwich.

May 7.—Visit to inspect the farm and premises of John Solomon, as to removal of quarantine.

May 9.—Visit to J. R. Longmore, to remove quarantine off farm.

May 11.—Visit to R. J. Parks, to remove quarantine.

May 23.—Visit to inspect hogs on the premises of Matthew Stuart, lot 1, con. 9, township of Chatham, and slaughter for swine plague.

May 29.—Visit to inspect hogs on the farm and premises of Thomas Brady, Raleigh township, and found disease not contagious.

July 9.—Visit to inspect the farm and premises of Thomas and Wiliam Montgomery, Raleigh township, as to cleansing and disinfecting of premises, removal of quarantine, &c.

July 10.—Visit to inspect farm and premises of Matthew Stuart, of Chatham township, as to release of farm from quarantine.

July 11.—Visited farm and premises of Peter Askile, lot 19, con. 9, township of Orford, and found disease not contagious.

July 27.—Visit to quarantine farm of Manson Campbell, of the township of Harwich.

July 30.—Visit to remove quarantine from premises of Geo. Duff, township of Horwich.

July 31.—Visit to slaughter hogs on the premises of Manson Campbell, Harwich township, for swine plague.

October 22.—Visit to inspect premises of M. Campbell, Harwich township, as to cleansing and disinfecting premises, removal of quarantine, &c.

Comparing this report with my report of 1899 shows that by the present system of dealing with hog cholera and swine plague, it can be completely stampel out, which has been done in this district.

I have the honour to be, sir,
Your obedient servant,

JOSEPH KIME, Jr.,
V. S.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 25.

REPORT ON HOG CHOLERA OR SWINE PLAGUE IN THE COUNTY OF BOTHWELL, ONT.

(J. R. Thorne, V.S.)

Wallaceburg, Ont., October 31, 1900.

Sir,—I have the honour to submit to you my annual report for the year ended October 31, 1900.

I have the pleasure to inform you that the health of stock in this district has been good during the past year; no contagious disease having existed in this district with the exception of tuberculosis, actinomycosis and a few cases of anthrax.

In January last I visited the farm of Mr. Frank Danials, in the township of Zone, and tested for tuberculosis; one cow which had been quarantined on suspicion since August, 1899, when a tuberculin test was made and disease found on the farm, these animals I found free of disease and had the quarantine raised.

In April last an outbreak of anthrax occurred on the farm of Mr. A. B. Young, in the gore of Chatham township, seven head of young cattle died with this disease.

Hog Cholera and Swine Plague.—This disease has not appeared in this district in the past year.

I have been called out several times to see hogs that were in a very unthrifty condition, and thought might be diseased, but upon investigation found it due to mismanagement ; this was proven by change of food or giving proper care when the hogs made rapid improvement.

I visited Walpole Island frequently but found no disease.

I have the honour to be, sir,
Your obedient servant,
J. R. THORNE, V.S.,
Inspector for West Bothwell.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 26.

REPORT OF THE VETERINARY INSPECTOR FOR NORTH ESSEX, ONT.

(Geo. W. Orchard, V.S.)

Windsor, November 1, 1900.

Sir,—I beg to submit to you my report of work done for the Department of Agriculture, from November 1, 1899, to October 31, 1900.

1899.

November 11.—Gave 'certificate of health' to H. G. Arnold & Sons, Maidstone P.O., for eight sheep for export to the United States.

November 15.—Gave 'certificate of health' to Thomas Thompson, Windsor, for five cattle, going to United States.

November 25.—Placed in quarantine, one Jersey cow, five years old, imported from the United States for breeding purposes by N. H. Shipley, Charing Cross, P.O.

November 27.—Tested Jersey cow imported November 25 with tuberculin ; no reaction.

December 1.—Examined and forwarded to Department of Agriculture, a copy of test chart of four cattle imported for breeding purposes by A. & G. Rice, Curries, P.O.

December 2.—Released Jersey cow imported by N. H. Shipley.

December 11.—Placed in quarantine, one Jersey cow, imported from the United States for breeding purposes by Joseph Lovell, Windsor, P.O.

December 13.—Tested above cow with tuberculin ; received no reaction.

December 13.—Gave 'certificate of health' to J. J. Mason, for forty calves for export to the United States.

December 16.—Visited and quarantined for hog cholera, the farm of John Dawson, lot 5, Malden road, Maidstone township; found fourteen hogs on farm, six affected and eight in contact; slaughtered all. Appraised value, $52.50.

December 19.—Released Jersey cow imported by Joseph Lovell, Windsor, P.O.

December 19.—Inspected and passed at Grand Trunk Railway, one black cow, part Jersey, and one Jersey cow, forming part of 'settler's effects' of H. Wooley, from Minden, Mich., going to Walkerville, Ont.: no certificates of health accompanied them.

December 20.—Visited and quarantined for hog cholera, the farm of Joseph Quinlan, lot 6, South Middle road, Maidstone township; found seven diseased, and fourteen hogs in contact ; slaughtered all. Appraised value, $55.

1900.

January 25.—Gave 'certificate of health' to John LaClair, Windsor, for one cow for export to the United States.

March 10.—Inspected and passed at the Michigan Central Railway, five hogs, forming part of 'settler's effects' of N. C. Hahn, from New Paris, Ohio, going to Port Arthur, and not accompanied by certificates of health.

March 12.—Examined and forwarded a copy of test chart of eight Hereford cattle, imported from the United States, for breeding purposes, by W. H. Hunter, Orangeville, Ont., and placed in quarantine, one Hereford calf, six weeks old, untested.

March 13 and 14.—Tested Hereford calf; no reaction.

March 13.—Visited and quarantined for hog cholera, the farm of Wm. Terry, lot 70, con. 1, Sandwich West township; found three hogs affected and eleven in contact ; slaughtered all. Appraised value, $84.75.

March 14.—Inspected and passed at Canadian Pacific Railway, two heifers, two years old: one bull, one year old; one ram and two ewes, forming part of 'settler's effects' of J. Wacker, from Manchester, Mich., going to Alberta, N.W.T., and not accompanied by certificates of health.

March 16.—Inspected and passed at Grand Trunk Railway, two cows and three horses, forming part of 'settler's effects' of Samuel Guest, from Clark, South Dakota, going to Thamesville, Ont. No certificate of health.

March 19.—Released to W. H. Hunter, Orangeville, Ont., Hereford calf, quarantined March 12.

March 27.—Inspected and passed at the Canadian Pacific Railway, one cow, three years old; one heifer, two years old; and two horses, forming part of 'settler's effects' of S. D. Pierce, from Wood County, Ohio, going to Alameda, Assiniboia, not accompanied by 'health certificates.'

April 1.—Inspected and passed at the Canadian Pacific Railway, one red cow, four years old, forming part of 'settler's effects' of A. E. Wilson, from Cass City, Mich., and going to Edmonton. No certificates of health accompanied entry.

April 5.—Inspected and passed at Canadian Pacific Railway, five cows and one calf, forming part of 'settler's effects' of John K. McLeod, from Peck, Sanilac County, Mich., going to Alberta, not accompanied by health certificates.

April 6.—Placed in quarantine one Jersey calf, eight weeks old, imported from the United States, for breeding purposes, by Mrs. Flannery, Maidstone, P.O.

April 8.—Tested above calf with tuberculin; no reaction.

April 9.—Visited and inspected quarantined farms of John Dawson and Joseph Quinlan, Maidstone township, and found farms cleansed and disinfected, and applied for their release from quarantine.

April 10.—Inspected and passed at Canadian Pacific Railway, four cows, three years old, and two hogs, forming part of 'settler's effects' of M. Richert, from Wyandotte, Mich., going to Calgary; not accompanied by health certificates.

April 12.—Received and forwarded releases from quarantine to John Dawson and Joseph Quinlan, at Essex, P.O., Ont.

April 17.—Inspected and passed at Michigan Central Railway, three cows, two calves, five horses and one colt, forming part of 'settler's effects' of Wm. Biniwell, from Worster, Ohio, going to Calgary; no certificates of health accompanied stock.

April 18.—Released quarantined calf to Mrs. Flannery, Maidstone, Ont.

April 23.—Took charge of two Hereford heifers, imported by O'Neil Bros., Southgate, Ont., from the United States, for breeding purposes ; test chart rejected.

May 1.—Tested above heifers with tuberculin ; no reaction.

May 3.—Released heifers and forwarded to O'Neil Bros., Southgate, Ont.

May 9.—Gave 'certificate of health' to Wheeler & Kennedy, for eighty-two calves, for export to the United States.

May 29.—Visited and inspected the quarantined farm of Wm. Terry, Sandwich West township; found premises cleansed and disinfected, and asked for release from quarantine.

June 2.—Received and forwarded Wm. Terry's release.

June 8.—Gave 'certificate of health' to Wheeler & Kennedy, for forty-two calves, for export to the United States.

July 5.—Visited and inspected hogs on Scotten estate; found no evidence of hog cholera as suspected.

August 21.—Gave 'certificate of health' to George W. Bell, Windsor, for six sheep, for export to the United States.

August 18.—Examined and forwarded copy of test chart of bull calf, nine months old, imported from the United States, for breeding purposes, by Hon. John Dryden.

October 20.—Inspected and passed at Grand Trunk Railway, two cars of horses, from Oklahoma, going to Tavistock, Ont., most of which were coughing ; found no contagious disease.

I have the honour to be, sir,
Your obedient servant,

GEO. W. ORCHARD, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 27.

REPORT OF S. E. BOULTER, V.S., INSPECTOR AT NIAGARA FALLS, ONT.

NIAGARA FALLS, October 31, 1900.

SIR,—I have the honour to submit my report of animals coming into Canada at this quarantine port, during the interval between November 1, 1899, and October 31, 1900.

		Horses.	Cattle.	Sheep.	Swine.	Remarks.
June	12..	R. McCulloch, Snellgrove, Ont....	.... ..	1	.....	.....	Tested on Entry.
"	12..	W. Wilson, Brampton, Ont.....	.....	.....	.....	2	Quarantine 15 days.
April	3..	A. Miller, Haysville, Ont.....	.....	.....	.....	1	" "
June	1..	Mrs. B. White, London, Ont.....	.....	1	.....	.....	Tested in Quarantine.
"	7..	Geo. Green, Fairview, Ont.	.....	.....	.....	2	Quarantined.
"	13..	Isaac Reed, Ardtrea, Ont.....	.....	.....	.....	1	"
"	20..	J. H. Holmes, Norwich, Ont.....	.....	.....	.....	1	"
July	21..	Cavan & Durham, Toronto, Ont .	.....	.....	.....	1	"
Aug.	29..	Inspected at G. T. R. Depot.....	.....	.....	1	.....	"
Sept.	8..	R. Cooper, Welland, Ont.....	1	.....	... .	.....	Inspected.
Oct.	1..	Blue Jean Co., Hamilton, Ont...	... ...	1	.....	.....	"
"	22..	Cavan & Durham, Toronto, Ont..	....	.....	.....	24	Quarantined.
"	30..	D. J. Galbraith, New-Castle, Ont.	.....	1	.....	.....	Inspected.
			1	4	1	32	

Total number of animals imported—38.

I have the honour to be, sir,
Your obedient servant,

S. E. BOULTER, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

NIAGARA FALLS, October 31, 1900.

SIR,—I beg to submit a short summary of work done by me for the Department of Agriculture in this Niagara district, during the year ended October 31, 1900.

Four cases of hog cholera have been reported to me during the year, of these only two proved to be cholera, both cases being in the township of Stamford, county of Welland.

There were slaughtered at the two farms fourteen hogs actually diseased, of a total value of $53 ; and twelve contact hogs slaughtered, valued at $76.

The farms were placed under quarantine. I also visited a few farms that had been quarantined a short time previous on account of cholera and found that the cleansing and disinfection had been carried out to my satisfaction in all cases with one exception, that of Joseph Galleys. His farm being placed under quarantine the third time within two years. I decided not to recommend the release for at least one year.

I am pleased to report that no further outbreaks have occurred during the past summer in this district.

I have applied the tuberculin test to three herds of cattle, comprising in all fifty-four head ; only one reacting to the test which was slaughtered ; post mortem examination revealing lung lesions. I have tested with tuberculin, and issued certificates for export for thirteen animals going to United States.

I have also tested with tuberculin three animals while in quarantine, coming into Canada from United States, and found them healthy.

Only one case of sheep-scab was reported as being suspicious. On investigation it was found not to be scab. I think I am safe in saying scab has been completely eradicated in this district. One case of Glanders has come under my notice. The animal affected being a thoroughbred mare coming from the southern states, and sold at Fort Erie race track to C. L. Bradley, of Wellandport, Ontario. I applied the Mallein test, which produced a marked reaction. I reported the case to the local authorities and the animal was destroyed. A close inspection of horses coming into Canada for racing and wintering would be a good safeguard against the introduction of glanders.

I have the honour to be, sir,
Your obedient servant,

S. E. BOULTER, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 28.

REPORT ON INSPECTION WORK IN PRINCE EDWARD ISLAND.

(W. H. Pethick, V.S.)

Central Bedique, October 31, 1900.

Sir,—In accordance with instructions just received, I have the honour to submit a brief report of my work for the year ending October 31, 1900.

I have pleasure in stating that the general health of horses, cattle, sheep and swine on Prince Edward Island has been excellent during the year. I have visited different parts of the province to investigate the reported existence of anthrax, hog cholera, and other contagious diseases, but found nothing to confirm the report, the disease in all cases being due to causes other than of a contagious character.

During the past year I have had the pleasure of meeting large numbers of farmers and dairymen at meetings held in the various districts, and discussing with them the important matter of contagious diseases of animals, dealing more especially with tuberculosis in cattle, and I am glad to inform you that the stockmen of this province manifest increasing interest in this important matter. Temperature charts, and all information relating to the herds examined by me, have from time to time been forwarded to your department. I may just say that I find our stockmen not only anxious to rid their herds of this disease, but willing to give every assistance to any movement that may have for its object the eradication of tuberculosis from the province. In my opinion, this would not be a very difficult matter to accomplish.

The very limited extent of the disease on this island, and consequently the small amount of money necessary for compensation, the willingness of our stockmen to aid in the work, our isolated position. our strict provincial Act providing for the quarantine and testing of all incoming cattle that are not accompanied by a health certificate signed by an official veterinarian, and the object lesson the accomplishment of the work would be to the rest of the Dominion, encourage our people to hope that the matter may receive your favourable consideration.

During the past summer I had the honour of meeting Mr. Hodson, Live Stock Commissioner for Canada, and at his request, and in accordance with your instructions, I accompanied him on his tour of Pictou and Antigonish counties, in Nova Scotia.

During the summer months I have arranged my work so as to be as much as possible in Prince County, in order that I might be available to the shippers of live stock from the port of Summerside, and I am glad to be able to say that all animals examined by me previous to shipment to foreign ports were in excellent health and condition.

I have the honour to be, sir,
Your obedient servant,

W. H. PETHICK, V.S.,
Inspector of Stock for P.E.I.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 29.

REPORT ON CHARLOTTETOWN, P.E.I., CATTLE QUARANTINE STATION.

(Andrew A. Leckie, M.R.C.VS.)

Charlottetown,
P.E. Island, November 1, 1900.

Sir,—The following list of shipments make up the year's work at this port, commencing November 1, 1899, ending October 31, 1900:—

Month.		Horses.	Cattle.	Sheep.	Swine.
1899.					
November 3	The Ss. Bona Vista, Black Diamond line, for Newfoundland	2	19	121	....
" 8	" Sch. Evelyn for West Indies	24	4	22	...
" 9	" Ss. Polino, Dobell line, for Newfoundland	...	....	221	....
" 23	" Ss. Bona Vista, Black Diamond line, for Newfoundland	2	22	350	6
" 28	" Ss. Cacouna, " " "	2	....	78	....
1900.					
May 9	The Ss. Cacouna, Black Diamond line, for Newfoundland	14	54	42	....
" 9	" Ss. Polino, Dobell line " "	3	12	.....	
" 18	" Ss. Bona Vista, Black Diamond line "	7	87	38	....
" 28	" Ss. Cacouna " "	....	77	15	....
" 31	" Sch. Onega, Demerara	....	1	.....	
June 4	" Ss. Bona Vista, Black Diamond line, for Newfoundland	1	70	30	....
" 6	" Ss. Polino, Dobell line "	...	18	14	2
" 20	" Ss. Greetlands " "	...	22	29	....
" 22	" Ss. Bona Vista, Black Diamond line "	1	49	87	19
July 3	" Ss. Polino, Dobell line "	....	15	97	....
" 9	" Ss. Bona Vista, Black Diamond line "	2	31	187	22
" 24	" Ss. Polino, Dobell line "	....	21	27	..
" 27	" Ss. Bona Vista, Black Diamond line "	1	29	108	6
August 13	" Ss. Bona Vista " "	....	51	98	.. .
" 15	" Ss. Polino, Dobell line "	....	33	18	....
" 31	" Ss. Bona Vista, Black Diamond line "	2	44	145	....
September 17	" Ss. Bona Vista " "	....	20	169	....
October 5	" Ss. Bona Vista " "	12	7	153	3
" 20	" Ss. Cacouna " "	7	12	222	5

This comprises the shipment made from this port.

August 27—B. & M. Rattenbury, 240 sheep per rail from Charlottetown to United States via. Summerside.

These export shipments figure up as follows, to various countries from Charlottetown, P.E.I. :—

United States—Sheep, 240.
West Indies—Horses, 24 ; cattle, 5 ; sheep, 22.
Newfoundland—Horses, 56 ; cattle, 703 ; sheep, 2,249 ; swine, 63.
Imports—December 28, 1899, stallion Kalol by Kremlin, from United States.

I have the honour to be, sir,
Your obedient servant,
ANDREW A. LECKIE, M.R.C.V.S.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 30.

CATTLE QUARANTINE.

(P. A. Robinson, V.S.)

Emerson, Man., November 13, 1900.

Sir,—I have the honour to report that the number of live stock inspected by me at the ports of Emerson and Gretna for the past twelve months ended October 31, 1900, is shown in the following tables :—

Port.	Horses.	Cattle.	Hogs.	Sheep.	Mules.
Gretna	1,077	304	156	160	61
Emerson	881	82	23	297	14
Total	1,958	386	179	457	75

I have the honour to be, sir,
Your obedient servant,

P. A. ROBINSON, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 31.

REPORT OF THE NORTH-WEST MOUNTED POLICE COMMISSIONER.

(A. Bowen Perry.)

Regina, November 18, 1900.

Sir,—I have the honour to submit my annual report of work performed for your department by the North-west Mounted Police, during the year ended October 31, 1900, together with the annual reports of the following veterinary inspectors, which give in detail the work they have performed :—

Inspector Burnett, V.S. ..... Macleod.
and Staff Sergt. Fraser.
Staff Sergt. Farr, V.S. ..... Lethbridge.
" Hobbs, V.S. ..... Calgary.
G. P. Dillon, Esq., V.S. ..... "
J. A. Church, Esq., V.S. ..... "
G. H. Acres, Esq., V.S. ..... "
Staff Sergt. Sweetapple, V.S. ..... Edmonton.
" Mountford, V.S. ..... Prince Albert.
" Matthews, V.S. ..... Regina.
" Ayre ..... "
" Mitchell, V.S. ..... N. Portal.
" Coristines, V.S. ..... Maple Creek.
J. C. Hargraves, Esq., V.S. ..... Medicine Hat.

I am glad to be able to report that the general health of the stock in the Territories is good. No serious outbreak of disease has occurred amongst the cattle, and I think a comparison with last year shows a general improvement in condition.

Mange, which threatened to become serious in the Medicine Hat district a year ago, has been successfully coped with, though it is probable that it will again show itself this coming winter and spring. There have been but very few outbreaks of anthrax. Antinomycosis still exists throughout the whole Territories, but is not on the increase ; tuberculosis has not been prevalent.

Horses have suffered from typhoid fever along the Saskatchewan, from Prince Albert to Edmonton. The cause is attributed to the very wet season. Ten years ago the same disease was prevalent in the Edmonton and Prince Albert districts.

Some 45,000 head of fat cattle were inspected for export ; not more than fifty were found diseased.

The following table shows the district shipped from and number :—

Saltcoats, Assa	628
Yorkton, Assa	5,853
Qu'Appelle	1,581
Maple Creek	8,175
North Portal	2,090
Moosomin	4,901
Macleod	6,284
Lethbridge	3,894
Calgary	9,144

This inspection has thrown a lot of work on the veterinary staff, who have often not been able, without calling in assistance, to keep up with the work, and prevent delay to shippers.

In some districts the time of our veterinary surgeons has been entirely devoted to your department.

One thousand two hundred and sixty cattle were imported at North Portal, the property of settlers.

Two thousand six hundred and twenty-seven horses were brought in at North Portal, and one thousand one hundred and ten at Maple Creek. Staff-Sergeant Mitchell states that the horses brought in at North Portal were of a very good class.

A total of $1,638.60 has been collected as inspection fees at the different ports of entry, all of which has been refunded to your department from time to time.

CATTLE.

TUBERCULOSIS.

Four cases in all occurred in the Territories, two at Maple Creek, and two in the Prince Albert district. All were destroyed. This disease is not prevalent.

ANTHRAX.

There were two outbreaks in the Prince Albert district, and 16 head died. There was an outbreak at Blackwood, Assa., and another at Whitewood, Assa. Six animals died. The herds were quarantined, and no further deaths took place.

The Edmonton district, where the disease has hitherto prevailed, is reported this year as free.

ACTINOMYCOSIS.

Sixty animals were destroyed in the Territories during the year suffering with this disease. It is generally distributed ; 10 were destroyed in Alberta, 22 in Saskatchewan, and 28 in Assiniboia. The disease is distinctly decreasing owing to the strong measures which have been taken.

OPHTHALMIA AND EYE DISEASE.

Veterinary Staff-Sergt. Coristine and Mr. Dillon, V.S., both refer to this disease, which does not appear to be contagious. Staff-Sergt. Coristine describes it as follows :—

'The disease begins with a watery acrid discharge from the eyes, and a white spot directly over the pupil, from which an effusion gradually spreads over the eye, till the whole organ is affected and assumes a whitish appearance.

'The disease is accompanied by an acute inflammation which runs a course of two or three weeks, when it subsides and the eye gradually regains its normal appearance.

'I have taken considerable interest in this, and do not think it contagious at all, but think it is caused by alkaline dust, as I have noticed it nearly altogether in dry, hot weather, and in localities where there are alkaline sloughs.'

No ill effects seem to follow.

MANGE.

All veterinary inspectors think that this disease has been controlled, and if the same measures are persisted in next year, as this just passed, it ought to be wiped out. I apprehend that it will require vigilence at the spring round-ups, and a careful application of the necessary remedies.

SHEEP.

Two cases of sheep scab were discovered near Calgary and promptly dealt with ; the disease occurred in the same district last year.

HOGS.

Swine plague was reported at Strathcona last summer. The diseased animals were promptly quarantined and the disease stamped out.

HORSES.

Ninety-one horses were destroyed during the year for glanders. The following table shows distribution of the disease :—

Assiniboia from Moosomin to Moosejaw	41
Maple Creek	1
S.E. Assiniboia	11
Prince Albert district	24
Calgary district	6
Macleod district	5
Edmonton district	3
Total	91

This disease has existed in Assiniboia for many years, and does not seem to be decreasing. The police everywhere pay special attention to the disease, and all suspicious cases are promptly reported.

Staff-Sergt. Matthews alone examined 209 suspects, and destroyed 41.

TYPHOID FEVER.

The loss of horses from this disease has been great in the Prince Albert, Battleford and Edmonton districts. Even if a horse attacked does recover the animal seems to be useless for a long time. In 1890-91, the disease was very prevalent in Prince Albert district. It appears to be from unpreventable causes.

GENERAL REMARKS.

All importations of stock from the United States have been very carefully inspected and not a single diseased animal found.

You are aware that stock ranging in Dakota and Montana, contiguous to the boundary line, wander across into the territories attracted by better pasturage, or driven by storms. This has been a matter of complaint for many years on the part of Canadian ranchers and police patrols, and especially employed men have attempted to check it. The great extent of country renders any such attempt almost futile. It is suggested that the American ranchers are not averse to aiding and directing their cattle to our luxurious grazing lands. If any such cases could be established, a vigorous application of the customs regulations would at once check the tendency. A certain control could be exercised if all round-ups by Americans were under police supervision, and all cattle taken across the line were properly inspected to see that there was no disease, and that no Canadian cattle were carelessly driven off.

In concluding my report, I am pleased to assure you that the veterinary inspectors have taken keen interest in their work. The officers commanding districts have worked energetically to carry out the regulations of the department. All instructions from me are given through these officers, and I hold them responsible that the work is done. Thus a great deal of important duty is imposed upon them for which they receive no remuneration, and I would respectfully ask that you allow them one hundred dollars per annum, the same as your inspectors receive.

I have the honour to be, sir,
Your obedient servant,

A. BOWEN PERRY,

Commissioner North-west Mounted Police.

No. 32.

REPORT ON CATTLE QUARANTINE STATION, VANCOUVER, B.C.

(J. W. Bland, V.S.)

Vancouver, B.C., November 14, 1900.

Sir,—I have the honour to report that the general health of horses, cattle, sheep and swine in the province of British Columbia during the past year has been good with few exceptions.

On May 30, I inspected 48 head of American merino sheep, owned by Pliny B. Norton, of Addison, Vermont, U.S.A., valued at $40,000—a magnificent flock indeed. Mr. Norton had eight new wooden crates built here for their ocean voyage to Sydney, New South Wales. Mr. Norton and myself removing them from palace horse car No. 58918, Canadian Pacific Railway, to wooden crates, with greatest care and animals comfort.

On July 11, I inspected and quarantined, according to regulations, one Jersey bull for stud purposes, owned by F. V. Harris. Giving tuberculin test without reaction.

According to regulations I inspected monthly the following animals, and it is gratifying to state without requiring to resort to Mallein test for horses or tuberculin test for cattle. I may add our bunch of cattle from the Okanagan district, some 70 in number, would be admired even at the Guelph fat stock show.

Again I have to thank the officers of Her Majesty's Customs for their kindness and assistance at quarantine station.

Appended is a detail of monthly statement showing the number of animals inspected by me at this port.

INSPECTIONS.

	Horses.	Mules.	Cattle.	Sheep.	Swine.
1899					
November	1		2		
December					
1900					
January	1				
February	20				
March	73	12	56		
April	23		205	125	52
May	63		265	279	14
June	66		264	545	179
July	32		730	1,278	192
August	58		578	703	199
September	12		580	455	60
October			77		
Total	349	12	2,757	3,385	696

I have the honour to be, sir,
Your obedient servant,

J. W. BLAND, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 33.

REPORT ON CATTLE QUARANTINE STATION, VICTORIA, B.C.

(S. F. Tolmie, V.S.)

Victoria, B.C., October 31, 1900.

Sir,—I have the honour to submit to you a report of the animals inspected at this port since July 20, the date of my appointment as inspector.

Sixty-three horses were inspected, sixty-one of which were imported, and two exported to California, for racing purposes. The horses imported were principally medium weight draft animals, and the balance livery and delivery horses, with a few unbroken bronchos. They are nearly all used in Victoria and its immediate vicinity, and were a good useful lot.

The four cattle inspected were all grade Jerseys, and good specimens, and were brought here by settlers.

One hundred and fifty-five sheep were imported for feeding and breeding purposes. One was a very good Hampshire Down ram, and the rest were grade Southdowns of only fair quality.

Thirty hogs passed inspection and were quarantined for the required period. They were Chester Whites and Berkshires, and a very good lot.

I applied the tuberculin test to four cattle, all of which passed the test.

The health of the animals in quarantine, in this district generally, has been good. No animals were condemned. Appended you will find a detailed list of animals inspected.

I have the honour to be, sir,
Your obedient servant,

S. F. TOLMIE,
V. S.

The Honourable
The Minister of Agriculture,
Ottawa.

Report of Animals Inspected at Victoria, B.C., from July 20, to October 31, 1900.

Date.	Name of Importer.	Whence Imported.	Destination.	Animals Inspected.				Remarks.
				Horses.	Cattle.	Sheep.	Swine.	
July 22	H. S. Ives	Washington	Sidney Island			101		
Aug. 2	B. C. Market Co	Oregon	Victoria	10				
" 12	Hy. Croft	Washington	"	2				
" 24	L. Goodacre	Oregon	"	4				
" 28	Wm. Lewtas	California	"	2				
Sept. 5	S. Huston	Washington	"	2				
" 12	John Richardson	Michigan	Prevost Island			1		
" 18	H. Lovell	Washington	Victoria District	1	4		27	Permission given to quarantine swine in Victoria Dist.
" 28	Jones & McNeill	Oregon	Victoria	18				
" 29	J. A. Lawrence	Washington	"	1				
Oct. 2	P. Crause	"	"	3				
" 5	West Minstrel Co	"	"	2				
" 16	A. R. Milne	"	"	1				
" 21	Wm. Munro	"	James Island			53		
" 29	Joseph Bland	Ohio	Victoria				3	Permission given to quarantine swine on Sampson St., Victoria.
" 30	Jones & McNeill	Idaho & Oregon	"	15				

S. L. TOLMIE, V. S.,
Veterinary Inspector.

No. 34.

REPORT OF VETERINARY INSPECTOR AT NELSON, B.C.

(J. A. Armstrong, V.S.)

Nelson, B.C., November 1, 1900.

Sir,—I have the honour to submit to you this, my report for the year ended October 31, 1900.

On November 1 I was called to the hog ranch of F. T. Hurry, where I found two hundred and seven head of swine, forty-eight of which were suffering from hog cholera. I had them all slaughtered and the premises disinfected.

On November 14 I went to the home of Joseph Blanchard, of Pilot Bay, B.C., and found four swine and one sow suffering from hog cholera. Had them all slaughtered and burned and the premises disinfected.

During the month of November two horses were imported from the United States to Ymir, B.C.

During the month of December I inspected the following : two horses for Ymir, B.C.; three horses for Molly Gibson Landing, B.C.; one horse for Nelson, B.C.

During the month of January : three horses for Nelson, B.C.

During the month of February : two horses for Molly Gibson Landing; eighteen horses for Nelson, B.C.; seventeen horses for Five Mile Point.

During the month of March : one horse for Erie, B.C.; one hog for Erie, B.C.

During the month of April : Five milch cows for Kaslo, B.C.; four pigs for Salmo, B.C.; two horses for Erie, B.C.; seven milch cows for Nelson, B.C.

During the month of May : one cow for Waneta, B.C; seven horses for Nelson, B.C.; two cows for Nelson, B.C.; two horses for Salmo, B.C.; one horse for Waneta, B.C.

During the month of June : fourteen horses for New Denver ; three horses for Erie, B.C.; one cow for Bedlington, B.C.; one horse for Nelson, B.C.; eight milch cows for Nelson, B.C.; four cows for Nelson, B.C.

During the month of August : one bull calf for Kaslo, B.C.; two milch cows for Sayward, B.C.; eleven head of cattle for Kaslo, B.C.

During the month of September : one cow for Bedlington, B.C.; six horses for Nelson, B.C.

During the month of September : ten horses for Nelson, B.C.; one horse for Ymir, B.C.; three cows for Kaslo, B.C.

During the month of October : ten horses for Nelson, B.C.; one horse for Ymir, B.C.; three cows for Kaslo, B.C.

During the year P. Burns & Co. imported six thousand five hundred and forty-three sheep for slaughter.

On September 4 last, I was notified of an outbreak of disease among cattle ranging in Kootenay Landing. On investigation I found that they were suffering from anthrax. The dead animals I had burned and the ashes buried, moved all the stock up into the mountains, and the disease subsided.

I have the honour to be, sir,
Your obedient servant,

J. A. ARMSTRONG, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 35.

REPORT OF VETERINARY INSPECTOR AT GRAND FORKS, B.C.

(S. C. Richards, V.S.)

Grand Forks, B.C., November 1, 1900.

Sir,—I have the honour to submit my annual report of animals imported into the Kettle River district for the year ending October 31, 1900.

The following animals were imported from the United States :—

Month.	Horses.	Cows.	Swine.	Sheep.
November	17	8	91	.....
December	4	.....	.....	.....
January	6	.....	.....	.....
February	7	15	.....	.....
March	4	.....	.....	71
April	11	7	47	.....
May	26	7	81	21
June	66	.....	.....	126
July	3	.....	9	.....
August	2	.....	.....	.....
September	.....	15	60	98
October	4	2	.....	.....
Total	150	54	197	316

Out of 54 cows 6 were found to be tuberculous, 5 of which were imported from the same farm in Washington, U.S.A. I am glad to say we have not had a recurrence of hog cholera this year, which proved so destructive last year in comparison to the number of hogs in the district. Four horses were killed, being affected with glanders. A number of horses have died from typhoid fever during the summer and fall months. This fever amongst horses in this district is the most fatal disease we have to contend with, and more especially amongst range horses, due to the advanced stage of the disease before it is discovered and the unfavourable conditions for treatment.

I have the honour to be, sir,
Your obedient servant,

S. C. RICHARDS, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 36.

REPORT ON EAST AND NORTH KOOTENAY DISTRICT, B.C.

(W. S. Bell, V.S.)

Cranbrook, B.C., October 31, 1900.

Sir,—I have the honour in accordance with your instructions to submit a report of my work for the year ending October 31, 1900.

During the past year I have had several outbreaks of swine fever, which in most cases proved fatal to the herd. I attributed the cause to the food, being slops from kitchens and hotels.

I have also had very bad outbreak of strangles, which took an irregular form, a number of the animals died, and several I destroyed. It was confined principally to Indian or native horses. I found very few cases among the better bred or imported ones. I find the native are more susceptible to all diseases of such kind on account of their being inbred.

I had one outbreak of glanders. Had the animals affected destroyed. I also stabled and quarantined a number that had a chance to contract the disease, and tested them, but no further outbreak occurred.

I have the honour to be, sir,
Your obedient servant,

W. S. BELL, V.S.

The Honourable
The Minister of Agriculture,
Ottawa.

Statement of Stock Inspected.

Date.	Name.	Cattle.
1899.		
Nov. 23....	McGinis & Co.	18
" 24....	McConell.	6
Dec. 21....	McGinis & Co.	94
" 23....	"	39
" 24....	"	82
1900.		
Jan. 23 ...	"	17
" 30....	P. Burns & Co.	17
" 31...	McGinis & Co.	18
Feb. 4...	"	16
" 6 ...	"	18
" 16...	"	20
May 5. .	"	18
" 16..	"	16
" 18....	"	18
" 23.. .	"	18
April 6...	McConell.	6
" 7....	McGinis & Co.	20
" 25...	"	18
" 26....	"	17
" 30....	"	17
June 6...	"	128
" 13....	P. Burns & Co.	20
" 30....	McGinis & Co. .	10
July 9...	"	22
" 13....	"	15
" 21....	P. Burns & Co.	160
" 29....	McGinis & Co.	20
" 30...	"	15
Aug. 4 ..	"	20
" 12....	"	20
" 18...	"	20
" 22...	McConell.	28
" 30...	McGinis & Co.	18
Sept. 8....	"	21
" 22..	"	21
Oct. 1...	M. Jackson, Carberry	83
" 7...	McGinis & Co.	67
" 9 ...	B. Morden.	7
" 10...	W. Gouldie.	17
" 12....	McGinis & Co.	21
" 15...	G. Mitchell.	83
	Total	1,300

Date.	Name.	Horses.
1900.		
Jan. 12...	Laurie Bros., glanders.	2
Mar. 16...	Pat. Quirk, Fort Steel, glanders	6
" 25....	J. Tripp, glanders, 2 destroyed	4
" 26...	D. H. Fausette, glanders, tested	4
June 11....	M. Balongie, Fort Steel, glanders	1
June 11...	A. O Bell, Fort Steel, glanders	1
July 1...	James Ryan, inspected.	6

Date.	Name.	Horses.
1900.		
July 6 ...	W. H. Bennett, Kallespell, U.S	12
" 7....	John Norgood Oregood, Kallespell, U.S.	12
" 22....	James Ryan, Kallespell, U.S..	7
" 30 ...	Indian House, Kallespell, U.S.	75
Aug. 1...	Indian House, Kallespell, U.S., 2 destroyed.	15
" 3....	Indian House, Kallespell, U.S., 1 destroyed.	5
" 6....	Indian House, Kallespell, U.S., 3 destroyed	3
" 7...	Indian House, Kallespell, U.S.	25
" 20...	Indian House, Kallespell, U.S., 2 destroyed	7
" 24....	Indian House, Kallespell, U.S., 3 destroyed	150
" 29....	M. Hambly House.	18
Sept. 3....	Teachers' House	2
" 4...	Muir & Co	2
" 7 ...	L. Doupe, C.P.R. survey.	1
" 8....	Vandicor & Co	1
" 17 ...	Robinson & McKenzie..	2
Oct. 9....	Manly Snider, Kallespell, U.S., for Red Deer	3
" 10....	Charles Bachand, Kallespell, for Red Deer	3
" 24....	Charles Steers, Kallespell, U.S.	13
	Total	378

Date.	Name.	Hogs.
1899.		
Nov. 15....	J. McMillan.	45
" 11	McGinis & Co.	145
" 24....	McConell.	85
1900		
Mar. 26....	"	82
April 16....	"	20
May 19....	McGinis & Co.	135
June 4....	St. Eugene Mission	20
Sept. 15...	J. Carroll.	5
" 23....	M. Pell.	66
Oct. 7...	McGinis & Co.	67
	Total	680

Date.	Name.	Sheep.
1899.		
Nov. 21....	McGinis & Co.	170
1900		
May 9....	"	160
June 22....	"	207
" 25....	"	215
	Total	752

W. S. BELL, V.S.,

Dominion Veterinary Inspector.

No. 37.

REPORT OF VETERINARY INSPECTOR AT ROSSLAND, B.C.

(C. E. Cornell, V.S.)

Rossland, B.C., November 1, 1900.

Sir,—I have the honour to submit to you this my report of stock inspected at the ports of entry of Rossland and Trail, for the year ended October 31, 1900.

The importations were mainly dairy cattle. They all received the tuberculin test. These were several found affected with tuberculosis, and they were slaughtered or returned from whence they came.

November, 1899.—Twenty-nine cows, one bull, one horse.
December, 1899.—Twenty-eight cattle, one horse.
January, 1900.—Twelve cows.
March, 1900.—Twenty-two cows, 63 hogs.
April, 1900.—Seventeen cows.
May, 1900.—Thirty-one cows, three horses.
June, 1900.—Fifty-six horses, 2 mules.
July, 1900.—Thirty-two cows, five horses.
August, 1900.—Twenty-nine cows, eighty hogs, 2 horses.
September, 1900.—Twenty-two cows, three horses.
October, 1900.—Two cows, eleven horses.

I have the honour to be, sir,
Your obedient servant,

C. E. CORNELL, V.S.,
Veterinary Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 38.

REPORT ON PICTOU CATTLE DISEASE IN NOVA SCOTIA.

(George Townsend, V.S.)

Office of the Inspector of Stock,
New Glasgow, N.S., October 31, 1900.

Sir,—I have the honour to submit, herewith, a statement showing number of cattle slaughtered for 'Pictou Cattle Disease' and amount of compensation paid therefor, during the year ended October 31, 1900.

I have the honour to be, sir,
Your obedient servant,

GEORGE TOWNSEND, V.S.

Statement of Cattle slaughtered and Amounts paid, from November 1, 1899 to October 31, 1900.

Month.	Number slaughtered.	Amount Paid.	Month.	Number slaughtered.	Amount Paid.
		$ cts.			$ cts.
November....	12	84 33	Brought forward.....	35	258 33
December.	5	40 00	May.....	10	74 00
January	1	10 00	June.	18	139 33
February.	4	24 00	July	32	257 00
March	5	39 00	August.....	27	222 00
April.	8	61 00	September.....	15	122 33
			October.....	12	79 00
Carried forward.	35	258 33	Total.....	149	1,151 99

GEORGE TOWNSEND, *V.S*,

The Honourable
The Minister of Agriculture,
Ottawa.

SESSIONAL PAPER No. 15

No. 39.

REPORT OF LIVE STOCK CARS AND YARDS.

(M. Auger).

Ottawa, November 12, 1900.

Sir,—I have the honour to submit to you my report covering the period from November 1, 1899, to October 31, 1900. During the year I have visited the large shipping stations of Ontario and Quebec to see that live stock cars were cleaned as soon as unloaded, which I found was generally done, an improvement on the year previous.

In travelling through the country I noticed that unloaded cattle cars were well cleaned as required.

There has also been some improvement on cattle and hog cars passing in transit from points in the United States through Canada to other points in the United States, more especially from Sarnia and Windsor to Buffalo, N.Y.

The cattle yards have been much improved and the different railroad companies seem to show more willingness to improve them than in the past, and I trust that before long they will see their way to have water in all their cattle yards where one car or more is shipped per week.

I have the honour to be, sir,

Your obedient servant,

MICHEL AUGER,
Inspector of Live Stock Cars and Yards.

The Honourable
The Minister of Agriculture,
Ottawa.

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CATTLE QUARANTINE.